

SERVICE MANUAL FZN250

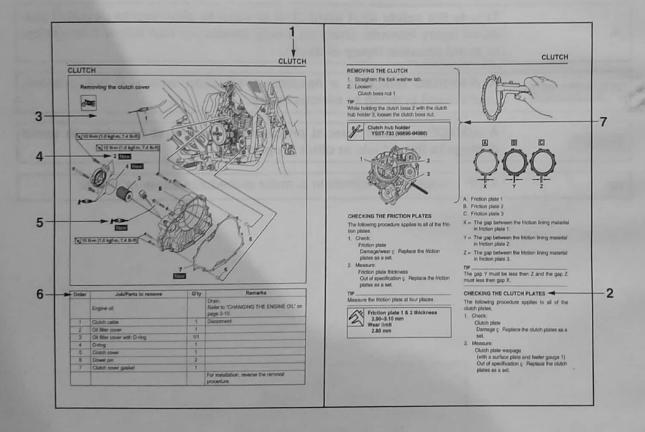


B97-F8197-E0

HOW TO USE THIS MANUAL

This manual is intended as a handy, easy-to-read reference book for the mechanic. Comprehensive explanations of all installation, removal, disassembly, assembly, repair and check procedures are laid out with the individual steps in sequential order.

- The manual is divided into chapters and each chapter is divided into sections. The current section title "1" is shown at the top of each page.
- Sub-section titles "2" appear in smaller print than the section title.
- To help identify parts and clarify procedure steps, there are exploded diagrams "3" at the start of each removal and disassembly section.
- Numbers "4" are given in the order of the jobs in the exploded diagram. A number indicates a disassembly step.
- Symbols "5" indicate parts to be lubricated or replaced. Refer to "SYMBOLS".
- A job instruction chart "6" accompanies the exploded diagram, providing the order of jobs, names of parts, notes in jobs, etc.
- Jobs "7" requiring more information (such as special tools and technical data) are described
- · sequentially.



SYMBOLS

The following symbols are used in this manual for easier understanding.

TIP

The following symbols are not relevant to every vehicle.

SYMBOL	DEFINTION SYMB		DEFINTION		
d 6	Serviceable with engine mounted	Ē	Engine oil		
7	Filling fluid		Molybdenum disulfide oil		
-	Lubricant		Lithium-soap-based grease		
H	Special tool		Molybdenum disulfide grease		
Sa.	Tightening torque	—6	Silicone grease		
24	Wear limit, clearance	D	Apply locking agent (LOCTITE®).		
0	Engine speed	New	Replace the part with a new one.		
	Electrical data	EM			

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CHAPTER 1 GENERAL INFORMATION

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IDENTIFICATION

VEHICLE IDENTIFICATION NUMBER (FRAME NO.)

The vehicle identification number "1" is stamped into the steering head pipe.



ENGINE SERIAL NUMBER

The engine serial number "1" is stamped into the crankcase.

TIP _______ Designs and specifications are subject to change without notice.



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FEATURES

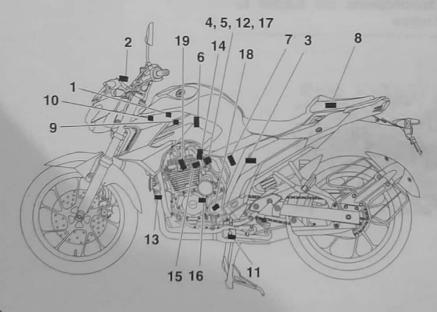
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OUTLINE OF THE FI SYSTEM

The main function of a fuel supply system is to provide fuel to the combustion chamber at the optimum air-fuel ratio in accordance with the engine operating condition. In the conventional carburetor system, the air-fuel ratio of the mixture that is supplied to the combustion chamber is created by the volume of the intake air and the fuel that is metered by the jet used in the respective carburetor. Despite the same volume of intake air, the fuel volume requirement varies by the engine operating conditions, such as acceleration, deceleration, or operation under a heavy load. Carburetors that meter the fuel through the use of jets have been provided with various auxiliary devices, so that an optimum air-fuel ratio can be achieved to accommodate the constant changes in the operating conditions of the engine.

As the requirements for the engines to deliver more performance and cleaner exhaust gases increase, it becomes necessary to control the air-fuel ratio in a more precise and finely tuned manner. To accommodate this need, this model has adopted an electronically controlled fuel injection (FI) system in place of a conventional carburetor system. This system can achieve an optimum air-fuel ratio required by the engine at all times by using a microprocessor that regulates the fuel injection volume according to the engine operating conditions detected by various sensors.

Adoption of the FI system has resulted in a highly precise fuel supply, improved engine response, better fuel economy, and reduced exhaust emissions. Furthermore, the air induction system (AI system) has been placed under computer control together with the FI system in order to realize cleaner exhaust gases.



- 1. Ignition coil
- 2. Engine trouble warning light
- 3. Air filter case
- 4. Intake air pressure sensor
- Intake air temperature sensor
- 6. Fuel pump
- 7. Battery
- 8. ECU (engine control unit)
- 9. Lean angle sensor
- 10. Relay unit

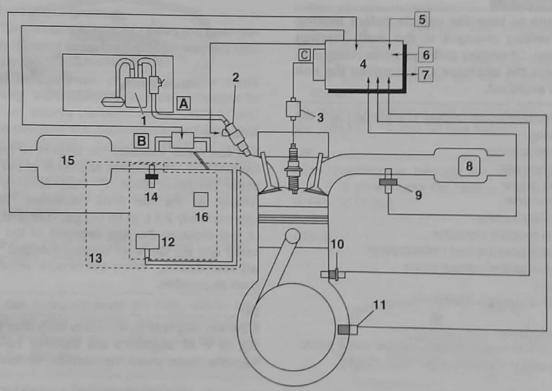
- 11. Catalyst
- 12. FID (Fast idle solenoid)
- 13. O₂ sensor
- 14. Fuel injector
- 15. Engine temperature sensor
- 16. Crankshaft position sensor
- 17. Throttle position sensor
- 18. Speed sensor
- 19. Spark plugs

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FI SYSTEM

The fuel pump delivers fuel to the fuel injector via the fuel filter. The pressure regulator (in the fuel pump) maintains the fuel pressure that is applied to the fuel injector at certain level. Accordingly, when the energizing signal from the ECU (engine control unit) energizes the fuel injector, the fuel passage opens, causing the fuel to be injected into the intake manifold only during the time the passage remains open. Therefore, the longer the length of time the fuel injector is energized (injection duration), the greater the volume of fuel that is supplied. Conversely, the shorter the length of time the fuel injector is energized (injection duration), the lesser the volume of fuel that is supplied.

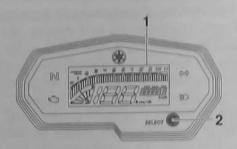
The injection duration and the injection timing are controlled by the ECU (engine control unit). Signals that are input from the throttle position sensor, crankshaft position sensor, intake air pressure sensor, intake air temperature sensor, engine temperature sensor, O2 sensor enable the ECU (engine control unit) to determine the injection duration. The injection timing is determined through the signals from the crankshaft position sensor. As a result, the volume of fuel that is required by the engine can be supplied at all times in accordance with the driving conditions Illustration is for reference only.



- 1. Fuel pump
- 2. Fuel injector
- 3. Ignition coil
- 4. ECU (engine control unit)
- 5. Speed sensor
- 6. Lean angle sensor
- 7. FID (fast idle solenoid)
- 8. Catalyst
- 9. O₂ sensor
- 10. Engine oil temperature
- 11. Crankshaft position sensor
- 12. Intake air pressure sensor
- 13. Throttle body
- 14. Intake air temperature sensor

- 15. Air filter case
- 16. Throttle position sensor
- A. Fuel system
- B. Air system
- C. Control system

MULTI-FUNCTION DISPLAY



- 1. Multi-function display
- 2. Selection button "SELECT"

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WARNING

Be sure to stop the vehicle before making any setting changes to the multi-function display. Changing settings while riding can distract the operator and increase the risk of an accident.

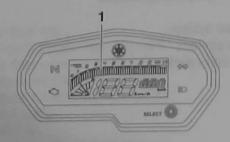
The multi-function display is equipped with the following:

- · speedometer
- · tachometer
- fuel meter
- odometer
- · two tripmeters
- · fuel reserve tripmeter
- · instantaneous fuel consumption
- · average fuel consumption
- · clock
- self-diagnosis device

Speedometer

The speedometer shows the vehicle's traveling speed in kilometers per hour (km/h).

Tachometer



1. Tachometer

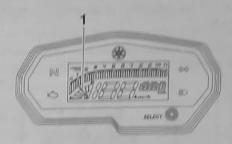
The tachometer shows the engine speed in revolutions per minute (r/min) x 1000. The tachometer is used to monitor the engine speed and keep it within the ideal power range.

EGAZ3050

NOTICE

When the engine speed is 9251 r/min and above, all tachometer segments will flash. Do not operate the engine in this zone.

Fuel meter



1. Fuel meter

The fuel meter indicates the amount of fuel in the fuel tank. The display segments of the fuel meter disappear from "F" (full) towards "E" (empty) as the fuel level decreases. When approximately 2.1 L (0.55 US gal, 0.46 Imp.gal) of fuel remains, the last segment of the fuel meter and the fuel level warning indicator "B" will start flashing. When this occurs, refuel as soon as possible.

TIP

If the last segment continues to flash after fueling, or if all segments are flashing, have a Yamaha dealer check the electrical system.

Odometer and tripmeters

A brief push (less than one second) on the "SELECT" button alternately switches the display between the odometer "ODO" and tripmeters "TRIP 1" and "TRIP 2", instantaneous fuel consumption "Km/L", average fuel consumption "AVE__._ Km/L" and clock "CLOCK" in the following order:

ODO \rightarrow TRIP 1 \rightarrow TRIP 2 \rightarrow Km/L \rightarrow AVE__. Km/L \rightarrow CLOCK \rightarrow ODO

Odometer

The odometer shows the total distance traveled by the vehicle.

Tripmeters

The tripmeter shows the total distance traveled since it was last reset.

To reset a tripmeter, select it by pushing the "SELECT" button for one second.

TIP_

- The odometer will lock at 999999 and cannot be reset.
- The tripmeters will automatically reset and continue counting after 999.9 is reached.

Fuel reserve tripmeter

The fuel reserve tripmeter shows the total distance traveled since the fuel level warning light comes on.

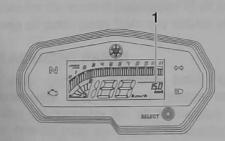
If the last segment of the fuel meter starts flashing, the display automatically changes to the fuel reserve tripmeter mode "TRIP F" and starts counting the distance traveled from that point. In this case, push the "SELECT" button to switch the display between the various tripmeter, odometer, instantaneous fuel consumption and average fuel consumption in the following order:

TRIP F \rightarrow TRIP 1 \rightarrow TRIP 2 \rightarrow Km/L \rightarrow AVE_ . Km/L \rightarrow CLOCK \rightarrow ODO \rightarrow TRIP F

TIP_

You can manually reset the fuel reserve tripmeter, or after refueling and traveling 5 km (3 mi), it will reset automatically and disappear from the display.

Instantaneous fuel consumption

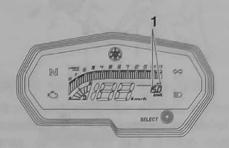


- 1. Instantaneous fuel consumption display
- "Km/L": The distance that can be traveled on 1.0 L of fuel under the current riding conditions is shown.

TIP.

If traveling at speeds under 10 km/h (6 mi/h), "__._" is displayed.

Average fuel consumption



1. Average fuel consumption display

This shows the average fuel consumption since it was last reset.

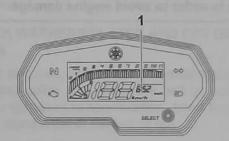
 "AVE__._ Km/L": The average distance that can be traveled on 1.0 L of fuel is shown.

To reset the average fuel consumption, push the "SELECT" button for one second.

TIP

After resetting the average fuel consumption, "___." is shown until the vehicle has traveled 0.1 km (0.06 mi).

Clock



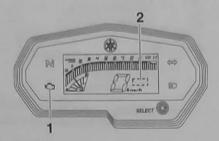
1. Clock

To set the clock

- 1. Turn the key to " \(\)".
- Push the "SELECT" switch to change the display to the clock mode.
- Push the "SELECT" button for two seconds, and the hour digits will start flashing.
- 4. Use the "SELECT" button to set the hours.
- 5. Push the "SELECT" button, and the minute digits will start flashing.

- Use the "SELECT" button to set the minutes.
- Push the "SELECT" button to confirm settings and start the clock.

Self-diagnosis mode



- 1. Engine trouble warning light "心"
- 2. Error code display

This model is equipped with a self-diagnosis function for various electrical circuits.

If a problem is detected in any of those circuits, the engine trouble warning light will come on and the display will indicate an error code.

If the display indicates any error codes, note the code number and have a Yamaha dealer check the vehicle.

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NOTICE

If the display indicates an error code, the vehicle should be checked as soon as possible in order to avoid engine damage.



IMPORTANT INFORMATION PREPARATION FOR REMOVAL AND DISASSEMBLY

 Before removal and disassembly, remove all dirt, mud, dust and foreign material.



- 2. Use only the proper tools and cleaning equipment.
 - Refer to "SPECIAL TOOLS" on page 1-14.
- When disassembling, always keep mated parts together. This includes gears, cylinders, pistons and other parts that have been "mated" through normal wear. Mated parts must always be reused or replaced as an assembly.



- 4. During disassembly, clean all of the parts and place them in trays in the order of disassembly. This will speed up assembly and allow for the correct installation of all parts.
- 5. Keep all parts away from any source of fire.

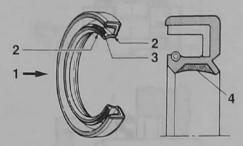
REPLACEMENT PARTS

Use only genuine Yamaha parts for all replacements. Use oil and grease recommended by Yamaha for all lubrication jobs. Other brands may be similar in function and appearance, but inferior in quality.



GASKETS, OIL SEALS AND O-RINGS

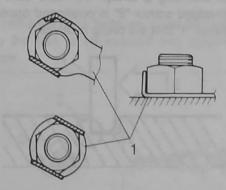
- When overhauling the engine, replace all gaskets, seals and O-rings. All gasket surfaces, oil seal lips and O-rings must be cleaned.
- During reassembly, properly oil all mating parts and bearings and lubricate the oil seal lips with grease.



- 1. Oil
- 2. Lip
- 3. Spring
- 4. Grease

LOCK WASHERS/PLATES AND COTTER PINS

After removal, replace all lock washers/plates "1" and cotter pins. After the bolt or nut has been tightened to specification, bend the lock tabs along a flat of the bolt or nut.



IMPORTANT INFORMATION

BEARINGS AND OIL SEALS

Install bearings "1" and oil seals "2" so that the manufacturer's marks or numbers are visible. When installing oil seals, lubricate the oil seal lips with a light coat of lithium-soap-based grease. Oil bearings liberally when installing, if appropriate.

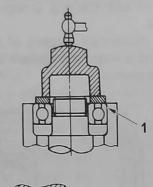
ECA13300

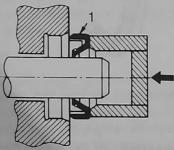
NOTICE

Do not spin the bearing with compressed air because this will damage the bearing surfaces.

RUBBER PARTS

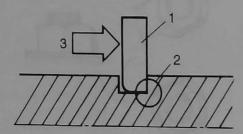
Check rubber parts for deterioration during inspection. Some of the rubber parts are sensitive to gasoline, flammable oil, grease, etc. Do not allow any items other than the specified one to contact the parts.





CIRCLIPS

Before reassembly, check all circlips carefully and replace damaged or distorted circlips. Always replace piston pin clips after one use. When installing a circlip "1", make sure the sharp-edged corner "2" is positioned opposite the thrust "3" that the circlip receives.





BASIC SERVICE INFORMATION

QUICK FASTENERS

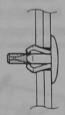
Rivet type

- 1. Remove:
 - · Quick fastener

TIP

To remove the quick fastener, push its pin with a screwdriver, then pull the fastener out.





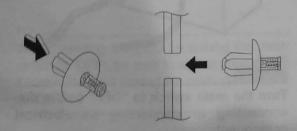


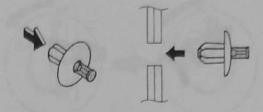


- 2. Install:
 - Quick fastener

TIP

To install the quick fastener, push its pin so that it protrudes from the fastener head, then insert the fastener into the part to be secured and push the pin in with a screwdriver. Make sure that the pin is flush with the fastener's head.



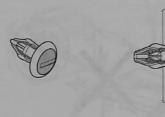


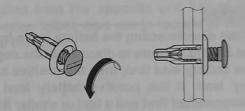
Screw type

- 1. Remove:
 - · Quick fastener

TIP

To remove the quick fastener, loosen the screw with a screwdriver, then pull the fastener out.

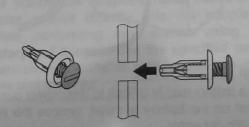




- 2. Install:
 - · Quick fastener

TIP

To install the quick fastener, insert the fastener into the part to be secured and tighten the screw.



NOTICE



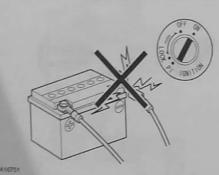


ELECTRICAL SYSTEM

Electrical parts handling

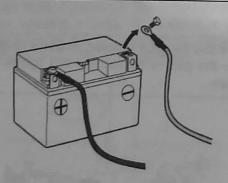
NOTICE

Never disconnect a battery lead while the engine is running; otherwise, the electrical components could be damaged.

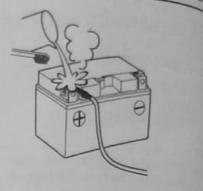


NOTICE

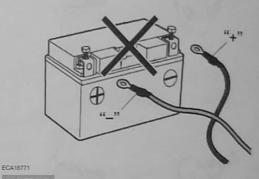
When disconnecting the battery leads from the battery, be sure to disconnect the negative battery lead first, then the positive battery lead is disconnected first and a tool or similar item contacts the vehicle, a spark could be generated, which is extremely dangerous.



If a battery lead is difficult to disconnect due to rust on the battery terminal, remove the rust using hot water.

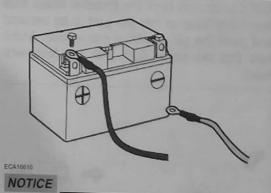


Be sure to connect the battery leads to the correct battery terminals. Reversing the battery lead connections could damage the electrical components.



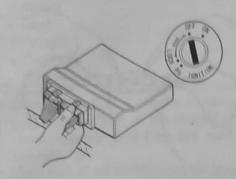
NOTICE

When connecting the battery leads to the battery, be sure to connect the positive battery lead first, then the negative battery lead. If the negative battery lead is connected first and a tool or similar item contacts the vehicle while the positive battery lead is being connected, a spark could be generated, which is extremely dangerous.



Turn the main switch to "OFF" before disconnecting or connecting an electrical component.

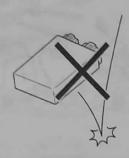




ECA18620

NOTICE

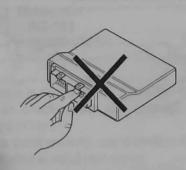
Handle electrical components with special care, and do not subject them to strong shocks.



ECA16630

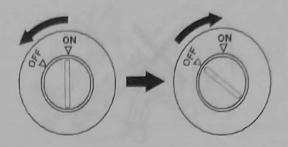
NOTICE

Electrical components are very sensitive to and can be damaged by static electricity. Therefore, never touch the terminals and be sure to keep the contacts clean.



TIP

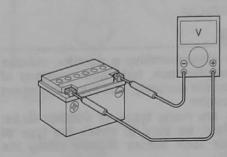
When resetting the ECU by turning the main switch to "OFF", be sure to wait approximately 5 seconds before turning the main switch back to "ON".



Checking the electrical system

TIP

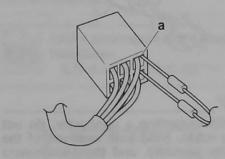
Before checking the electrical system, make sure that the battery voltage is at least 12 V.



ECA1437

NOTICE

Never insert the tester probes into the coupler terminal slots. Always insert the probes from the opposite end "a" of the coupler, taking care not to loosen or damage the leads.

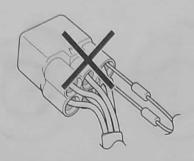


ECA16640

NOTICE

For waterproof couplers, never insert the tester probes directly into the coupler. When performing any checks using a waterproof coupler, use the specified test harness or a suitable commercially available test harness.





Checking the connections

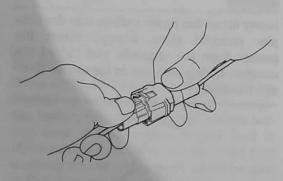
Check the leads, couplers, and connectors for stains, rust, moisture, etc.

- 1. Disconnect:
 - · Lead
 - · Coupler
 - Connector

ECA16780

NOTICE

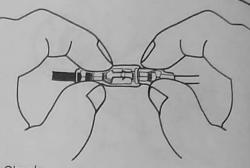
- When disconnecting a coupler, release the coupler lock, hold both sections of the coupler securely, and then disconnect the coupler.
- There are many types of coupler locks; therefore, be sure to check the type of coupler lock before disconnecting the coupler.



ECA16790

NOTICE

When disconnecting a connector, do not pull the leads. Hold both sections of the connector securely, and then disconnect the connector.



2. Check:

- Lead
- · Coupler
- Connector
 Moisture → Dry with an air blower.
 Rust/stains → Connect and disconnect several times.

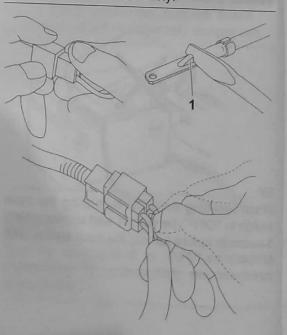


3. Check:

All connections
 Loose connections → Connect properly.

TIP

- If the pin "1" on the terminal is flattened, bend it up.
- After disassembling and assembling a coupler, pull on the leads to make sure that they are installed securely.

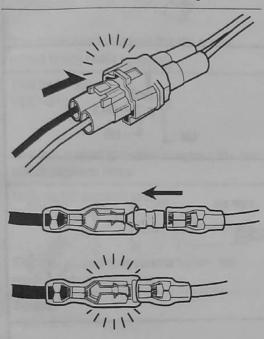




- 4. Connect:
 - · Lead
 - · Coupler
 - · Connector

TIP.

- When connecting a coupler or connector, push both sections of the coupler or connector together until they are connected securely.
- · Make sure all connections are tight.



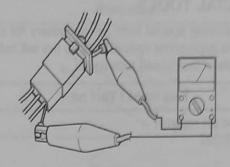
- 5. Check:
 - Continuity (with the Multimeter)

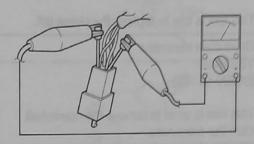


Multimeter INS-003 (90890-03243)

TIP

- · If there is no continuity, clean the terminals.
- When checking the wire harness, perform steps (1) to (3).
- As a quick remedy, use a contact revitalizer available at most part stores.





- 6. Check:
 - Resistance



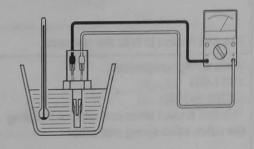
Multimeter INS-003 (90890-03243)

TIE

The resistance values shown were obtained at the standard measuring temperature of 20 °C (68 °F). If the measuring temperature is not 20 °C (68 °F), the specified measuring conditions will be shown.



Intake air temperature sensor resistance 5.70-6.30 k Ω at 0 °C (32 °F)





SPECIAL TOOLS

The following special tools are necessary for complete and accurate tune-up and assembly. Use The following special tools are necessary for complete and accurate tails ap and assembly. Us only the appropriate special tools as this will help prevent damage caused by the use of inappropriate

Tool name / Tool no.	Illustration
Piston pin replacer YSST-207 This tool is use to replace the piston pin.	085 013
Crankcase separator YSST-265 (90890-01135) This tool is used to remove the crankshaft from the crankcase.	Ø9.5 M8
Crankshaft installing tool with spacer YSST-266 YSST-267 (90890-01284) (90890-04081) Crankshaft installing (Extension) YSST-1266 These tools are used for installing the crankshaft.	YSST-266
TFF oil seal remover YSST-270 This tool is used to remove Oil seal.	6
New magneto holder YSST 601 B This tool is used to hold the magneto.	Ø 13 PCD 74
Valve spring compressor YSST-603 (90890-04109) This tool is used when removing or installing the valve, valve spring and cotter.	

Tool name / Tool no.	Illustration
Piston base YSST-604 (90890-01067) This tool is used to support the piston.	120
Small screw driver YSST-609 This tool is used to adjust throttle screw/ retract timing chain tensioner.	Thickness= 1mm
Torx bit (T-30) YSST-611 This tool is used to loosen or tighten the cam shifter segment screw.	13sq
Main switch steering lock YSST-611 A This tool is used to loosen or tighten the main switch steering lock.	T30
Scraper YSST-612 This tool is used to scrap the sealant from crankcase surface.	T1.6
Cup-B YSST-620-B This tool is used to remove the bearings of rear wheel (LH & RH), front wheel (LH & RH) and main axle.	OD- 48 ID- 38
Cup- C YSST-620-C This tool is used to remove the bearing of drive axle, balancer shaft and cam shaft bearing	OD- 53 ID- 48

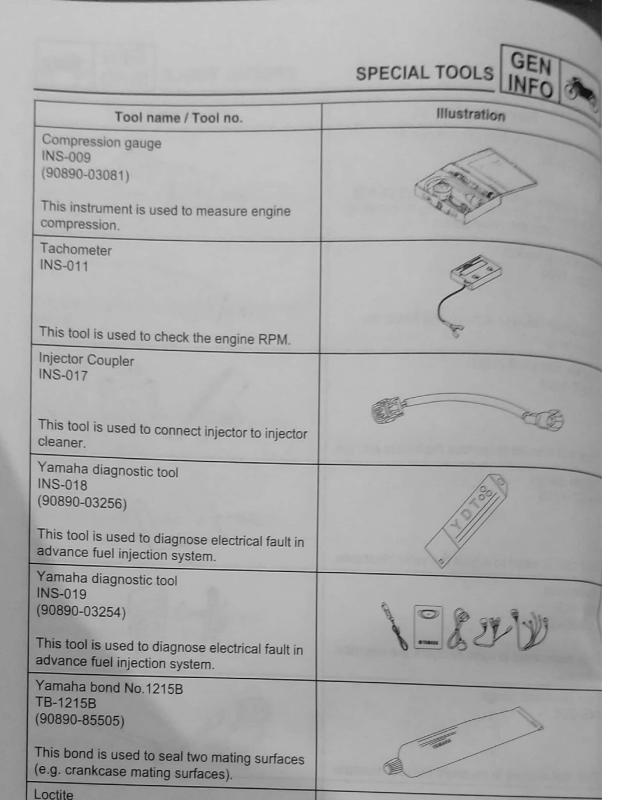
Tool name / Tool no.	Illustration
Bearing puller 6202 YSST-624 This tool is used to remove the bearings of front wheel (LH & RH), rear wheel (LH & RH)/ sprocket hub and balancer shaft bearing.	Ø 15————————————————————————————————————
Bearing puller 6203 YSST-624 A This tool is used to remove the bearing of drive axle and axle bearing	Ø 17 → CCC
Center plug spanner YSST-625 This tool is used to remove/install the timing mark accessing screw/crankshaft end accessing screw from magneto cover.	Ø20 Ø20
Upper and lower race installer YSST-626 Upper race installer attachment YSST-1226 This tool is used to install upper and lower races.	YSST 626 YSST 1226 30 30 50
New magneto puller YSST-628 This tool is used to remove the AC Magneto rotor with the help of magneto holder.	Ø30 X 1.5P
Fixing tool bearing steering lower YSST-670 This tool is used to install under bracket bearing steering lower.	Ø 36 Ø 285
Tappet screw holder YSST-706 (90890-04154) This tool is used to adjust valve clearance.	

Tool name / Tool no.	Illustration
Socket steering nut (6-Teeth) YSST-721 This tool is used to loosen and tighten the steering ring nut.	OD-Ø45 ID - Ø35.5
Clutch hub holder YSST-733 (90890-04086) This tool is used to hold the Clutch boss while loosening & tightening clutch boss nut.	698
Tubeless tire puncture kit YSST-736	
To repair the puncture of tubeless tires. Tappet adjusting socket YSST-806 A This tool is used to adjust valve clearance.	Hex 10
T - handle YSST-813 This tool is used to hold the TFF cylinder 28 mm hexagon nut/socket wrench when removing or installing the damper rod.	H8X 28
Rear shock absorber adjuster YSST-821 This tool is used to adjust the rear shock absorber.	6X5 Ø70
Bearing puller YSST-824 This tool is used to remove the bearing of camshaft.	Ø 15

Section and March	SPECIAL TOOLS GEN INFO
Tool name / Tool no.	Illustration
TFF oil seal installation tool YSST-875 This tools is used to install the oil seal and the dust seal of the front fork legs.	Ø41
Special plier YSST-888 This tool is used to remove and fix weight with wheel.	
Wheel balancer YSST-889 This tool is used to check balance the wheel.	
Disc brake face out YSST-890 This tool is used to check the disc runout.	
Bush YSST-893 This tool is used as an attachment with crankcase separator (YSST-265).	ODØ18 IDØ12
Bearing punch with pilot driver YSST-951 This tool is used to install the bearings.	
Rotor holder tool S 1113 (90890-01235) This tool is used to hold the drive sprocket.	6.5
Funnel with long tail S 1119	

This funnel is used to fill engine oil in crankcase.

Tool name / Tool no.	Illustration
Adopter for valve spring compressor YSST-1203 This adopter is an attachment of YSST-603. This tool is used when removing or installing the valve and the valve spring.	Ø32 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \
Spark plug socket YSST-1206 This tool is used to remove and install the spark plug.	Ø18
Rocker arm shaft puller YSST-1208 This tool is used to remove the rocker arm pin.	Ø110 Ø6
Feeler gauge YSST-1215 This tool is used to adjust the valve clearance.	0.08
Multimeter INS-003 (90890-03243) This instrument is used to check the electrical system.	
Fuel pressure gauge INS-006 This tool is used to measure the fuel pressure.	O TO
Ignition checker INS-007 (90890-06754) This tool is used to check efficiency of ignition at spark plug.	



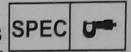


Three bond 1322

CHAPTER 2 SPECIFICATIONS

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GENERAL SPECIFICATIONS SPEC



GENERAL SPECIFICATIONS

Model		
Model	B971	
Dimensions	THE RESIDENCE AND ADDRESS OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NAMED IN COLUM	-16/7
Overall length	2015 mm (79.3 in)	
Overall width	770 mm (30.3 in)	
Overall height	1075 mm (42.3 in)	
Wheelbase	1360 mm (53.5 in)	
Ground clearance	160 mm (6.30 in)	
Minimum turning radius	2.5 m (8.20 ft)	
Weight		1
Curb weight	148 kg (326 lb)	
Loading	Total Control of the	TEAL PROPERTY.
Maximum load	165 kg (364 lb)	
Riding capacity	2 persons	

MAINTENANCE SPECIFICATION (ENGINE)



MAINTENANCE SPECIFICATION (ENGINE)

		×		
n	\mathbf{a}	1	n	e
nn.	23	۸	м.	

Combustion cycle Cooling system Valve train Displacement Number of cylinders Bore × stroke

Compression ratio Compression pressure

Starting system

4-stroke Air cooled SOHC 249 cm³

Single cylinder 74.0 × 58.0 mm (2.91 × 2.28 in)

1044-1344 kPa/300 r/min (10.4-13.4

kgf/cm²/300 r/min, 148.5-191.2 psi/300 r/min)

Fuel

Recommended fuel Fuel tank capacity

Regular unleaded gasoline only 14 L (3.7 US gal, 3.1 Imp.gal) Fuel reserve amount 2.1 L (0.55 US gal, 0.46 Imp.gal)

Engine oil

Recommended brand SAE viscosity grades Recommended engine oil Lubrication system Engine oil quantity Oil change With oil filter removal Quantity (disassembled)

YAMALUBE 10W-40 API service SL type, JASO standard MA

1.35 L (1.43 US qt, 1.19 Imp.qt) 1.45 L (1.53 US qt, 1.28 Imp.qt) 1.55 L (1.64 US qt, 1.36 Imp.qt)

Oil filter

Oil filter type

Paper

Oil pump

Inner-rotor-to-outer-rotor-tip clearance Outer-rotor-to-oil-pump-housing clearance clearance

Oil-pump-housing-to-inner-and-outer-rotor Limit Relief valve operating pressure

0.150 mm (0.0059 in) 0.23 mm (0.0091 in) 0.10-0.15 mm (0.0039-0.0059 in) 0.22 mm (0.0087 in)

0.04-0.09 mm (0.0016-0.0035 in) 0.16 mm (0.0063 in) 850.0 kPa (8.50 kgf/cm², 123.3 psi)

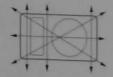
Spark plug(s)

Manufacturer/model Spark plug gap

NGK/DR8EA 0.6-0.7 mm (0.024-0.028 in)

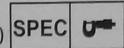
Cylinder head

Warpage limit



0.05 mm (0.0020 in)

MAINTENANCE SPECIFICATION (ENGINE)



Camshaft

Camshaft lobe dimensions

Lobe height (Intake)

Limit

Lobe height (Exhaust)

Limit

Camshaft runout limit

36.890-36.990 mm (1.4524-1.4563 in)

36.790 mm (1.4484 in)

36.890-36.990 mm (1.4524-1.4563 in)

36.790 mm (1.4484 in)

0.030 mm (0.0012 in)

Rocker arm/rocker arm shaft

Rocker arm inside diameter

Limit

Rocker arm shaft outside diameter

Limit

12.000-12.018 mm (0.4724-0.4731 in)

12.033 mm (0.4737 in)

11.981-11.991 mm (0.4717-0.4721 in)

11.950 mm (0.4705 in)

Valve, valve seat, valve quide

Valve clearance (cold)

Intake

Exhaust

Valve dimensions

Valve seat contact width (intake)

Limit

Valve seat contact width (exhaust)

Limit

Valve stem diameter (intake)

Limit

Valve stem diameter (exhaust)

Limit

Valve guide inside diameter (intake)

Valve guide inside diameter (exhaust)

Valve-stem-to-valve-guide clearance (intake)

Limit

Valve-stem-to-valve-guide clearance (exhaust)

Limit

Valve stem runout

0.05-0.10 mm (0.0020-0.0039 in) 0.08-0.13 mm (0.0032-0.0051 in)

0.90-1.20 mm (0.0354-0.0472 in)

1.7 mm (0.07 in)

0.90-1.20 mm (0.0354-0.0472 in)

1.7 mm (0.07 in)

5.975-5.990 mm (0.2352-0.2358 in)

5.945 mm (0.2341 in)

5.960-5.975 mm (0.2346-0.2352 in)

5.930 mm (0.2335 in)

6.000-6.012 mm (0.2362-0.2367 in)

6.000-6.012 mm (0.2362-0.2367 in)

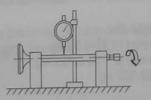
0.010-0.037 mm (0.0004-0.0015 in)

0.080 mm (0.0032 in)

0.025-0.052 mm (0.0010-0.0020 in)

0.100 mm (0.0039 in)

0.010 mm (0.0004 in)



Valve spring

Inner spring

Free length (intake)

Limit

Free length (exhaust)

Limit

Spring tilt (intake)

Spring tilt (exhaust)

Outer spring

Free length (intake)

Limit

Free length (exhaust)

imit

Spring tilt (intake)

Spring tilt (exhaust)

36.17 mm (1.42 in)

34.36 mm (1.35 in)

36.17 mm (1.42 in)

34.36 mm (1.35 in)

1.7 mm (0.07 in)

1.7 mm (0.07 in)

36.63 mm (1.44 in)

34.80 mm (1.37 in)

36.63 mm (1.44 in)

34.80 mm (1.37 in)

1.7 mm (0.07 in)

1.7 mm (0.07 in)

MAINTENANCE SPECIFICATION (ENGINE) SPEC

Cylinder

Bore

74.000-74.016 mm (2.9134-2.9140 in)

74.066 mm (2.9160 in)

Piston

Diameter D

Wear limit

Measuring point (from piston skirt bottom)

Piston-to-cylinder clearance Piston pin bore inside diameter

Limit

Piston pin outside diameter

Piston-pin-to-piston-pin-bore clearance

73.983-73.998 mm (2.9127-2.9133 in)

5.0 mm (0.20 in)

0.010-0.025 mm (0.0004-0.0010 in)

17.002-17.013 mm (0.6694-0.6698 in)

17.033 mm (0.6706 in)

16.991-17.000 mm (0.6689-0.6693 in)

16.980 mm (0.6685 in)

0.002-0.022 mm (0.0001-0.0009 in)

Piston ring

Top ring Ring type

End gap (installed)

End gap limit

Ring side clearance

Side clearance limit

2nd ring

Ring type

End gap (installed)

End gap limit

Ring side clearance

Side clearance limit

Crankshaft

Crank assembly width

Runout limit

Barrel

0.19-0.31 mm (0.0075-0.0122 in)

0.56 mm (0.0220 in)

0.030-0.065 mm (0.0012-0.0026 in)

0.115 mm (0.0045 in)

Taper

0.30-0.45 mm (0.0118-0.0177 in)

0.80 mm (0.0314 in)

0.020-0.055 mm (0.0008-0.0022 in)

0.115 mm (0.0045 in)

69.25-69.30 mm (2.726-2.728 in)

0.030 mm (0.0012 in)

Clutch

Clutch type

Clutch lever free play Friction plate thickness

Wear limit

Plate quantity

Friction plate thickness

Wear limit Plate quantity

Friction plate thickness

Wear limit Plate quantity

Clutch plate thickness

Plate quantity Warpage limit

Clutch spring free length

Limit

Spring quantity

Push rod bending limit

Wet, multiple-disc

10.0-15.0 mm (0.39-0.59 in)

2.90-3.10 mm (0.114-0.122 in)

2.60 mm (0.102 in)

2.90-3.10 mm (0.114-0.122 in)

2.60 mm (0.102 in)

4 pcs

2.90-3.10 mm (0.114-0.122 in)

2.60 mm (0.1024 in)

1 pc

1.50-1.70 mm (0.0591-0.0669 in)

5 pcs

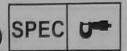
0.20 mm (0.008 in) 41.60 mm (1.64 in)

39.60 mm (1.56 in)

4 pcs

0.30 mm (0.012 in)

MAINTENANCE SPECIFICATION (ENGINE) SPEC



Drivetrain	0.000 (74/04)			
Primary reduction ratio	3.083 (74/24)			
Transmission type	Constant mesh 5-speed			
Gear ratio	0.574 (00(44)			
1st	2.571 (36/14)			
2nd	1.684 (32/19) 1.273 (28/22) 1.040 (26/25) 0.852 (23/27)			
3rd				
4th				
5th				
Main axle runout limit	0.08 mm (0.0032 in)			
Drive axle runout limit	0.08 mm (0.0032 in)			
Main axle assembly width	102.20-102.40 mm (4.02-4.03 in)			
Secondary reduction ratio	3.067 (46/15)			
Final drive.	Chain			
Air filter	to the same of the			
Air filter element	Oil-coated paper element			
Fuel pump	AND I and the post Place to the loss explored			
Pump type	Electrical			
Maximum consumption amperage	1.7 A			
Fuel injector	The state of the s			
Resistance	12.2 Ω			
Throttle body				
ID mark	B971 00			
Idling condition				
Engine idling speed	1300–1500 r/min			
O ₂ feedback control	Inactive			
Exhaust gas sampling point	Sampling port on the exhaust pipe			
Engine temperature	115-125 °C (239-257 °F)			
CO%	0.0-2.0 %			
Fuel line pressure (at idle)	220-300 kPa (2.2-3.0 kgf/cm ² , 31.9-43.5 psi)			
Throttle grip free play 3.0-5.0 mm (0.12-0.20 in)				
The state of the s				

MAINTENANCE SPECIFICATION (CHASSIS) SPEC



MAINTENANCE SPECIFICATION (CHASSIS)

C			~	

Frame type Caster angle

Trail

Diamond 24.5°

98 mm (3.9 in)

Front wheel

Wheel type Rim size Rim material

Radial wheel runout limit Lateral wheel runout limit Wheel axle bending limit Cast wheel 17M/C × MT2.50 Aluminum 1.0 mm (0.04 in)

0.5 mm (0.02 in) 0.25 mm (0.01 in)

Rear wheel

Wheel type
Rim size
Rim material
Radial wheel runout limit
Lateral wheel runout limit
Wheel axle bending limit

Cast wheel 17M/C × MT4.00 Aluminum 1.0 mm (0.04 in) 0.5 mm (0.02 in) 0.25 mm (0.01 in)

Front tire

Type Size

Manufacturer/model

Tubeless

100/80-17M/C 52P

MRF/NYLOGRIP ZAPPER-FX1

Rear tire

Type Size

Manufacturer/model

Tubeless

140/70-17M/C 66S

MRF/NYLOGRIP ZAPPER-S2

Tire air pressure (measured on cold tires)

Front Rear

175 kPa (1.75 kgf/cm², 25 psi, 1.75 bar) 200 kPa (2.00 kgf/cm², 29 psi, 2.00 bar)

Front brake

Type

Disc outside diameter × thickness

Brake disc thickness limit

Brake disc runout limit (as measured on wheel)

Brake pad lining thickness

Limit

Master cylinder inside diameter

Caliper cylinder inside diameter (Right)

Specified brake fluid

Hydraulic single disc brake 282.0 x 4.0 mm (11.10 x 0.16 in)

3.5 mm (0.14 in)

0.10 mm (0.0039 in)

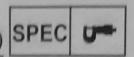
4.3 mm (0.17 in) 0.8 mm (0.03 in)

0.8 mm (0.03 in) 12.00 mm (0.47 in)

28.00 mm, 28.00 mm (1.10 in, 1.10 in)

DOT 4

MAINTENANCE SPECIFICATION (CHASSIS)



Rear brake

Type Disc outside diameter × thickness

Brake disc thickness limit

Brake disc runout limit (as measured on wheel)

Brake pad lining thickness

Limit

Master cylinder inside diameter Caliper cylinder inside diameter

Specified brake fluid

Hydraulic single disc brake

220.0 × 4.5 mm (8.66 × 0.18 in)

4.0 mm (0.1575 in)

0.10 mm (0.0039 in)

5.5 mm (0.22 in)

1.5 mm (0.06 in)

12.7 mm (0.50 in)

30.23 mm (1.19 in)

DOT 4

Front suspension

Type Spring

Shock absorber

Fork spring free length

Limit

Quantity (left) Quantity (right)

Level (left) Level (right)

Recommended oil

Telescopic fork Coil spring

Hydraulic damper

235.0 mm (9.25 in)

230.3 mm (9.07 in)

469.0 cm³ (15.86 US oz, 16.54 lmp.oz) 469.0 cm³ (15.86 US oz, 16.54 lmp.oz)

75 mm (3.0 in) 75 mm (3.0 in)

Rear suspension

Type

Spring

Shock absorber

Spring preload

Adjusting system

Unit for adjustment

Adjustment value (Soft) Adjustment value (STD)

Adjustment value (Hard)

Swingarm

G10 fork oil

Coil spring Hydraulic damper

Mechanical adjustable type

Cam position

3

7

Drive chain

Chain type

Number of links

Drive chain slack (Maintenance stand)

15-link length limit

Sealed type

136

40.0-45.0 mm (1.57-1.77 in)

50.0 mm (1.97 in)

191.5 mm (7.54 in)

MAINTENANCE SPECIFICATION (ELECTRICAL) MAINTENANCE SPECIFICATION (ELECTRICAL)			
Voltage		-	
System voltage	12 V		
Ignition system			
lanition system	TCI		
Advancer type	Digital		
Ignition timing (B.T.D.C.)	10.0°/1400 r/min		
Engine control unit		_	
Model	TBDFV6		
Ignition coil		_	
Primary coil resistance	2.16-2.64 Ω		
Secondary coil resistance	8.64–12.96 kΩ		
Spark plug cap		_	
Resistance	3.75-6.25 kΩ		
Lean angle sensor output voltage		-	
Operating angle	50°		
Output voltage up to operating angle	0.4-1.4 V		
Output voltage over operating angle	3.7-4.4 V		
Charging system		_	
Charging system	AC magneto		
Standard output	14.0 V, 11.5 A at 5000 r/min		
Standard output	14.0 U, 162 W at 5000 r/min		
Stator coil resistance	0.456-0.684 Ω		
Rectifier/regulator			
Regulator type	Single-phase		
Regulated voltage (DC)	14–14.8 V		
Rectifier capacity (DC)	16.0 A		
Battery			
Model	ETZ-7		
Voltage, capacity	12 V, 6.0 Ah (10 HR)		
Bulb, wattage			
Headlight	LED		
Brake/tail light	LED		
Front turn signal light	10.0 W		
Rear turn signal light	10.0 W		
Auxiliary light	5.0 W		
License plate light	5.0 W LED		
Meter lighting	LED		
ndicator light	LED		
Neutral indicator light	LED		
High beam indicator light	LED LED		
Turn signal indicator light Engine trouble warning light	LED		

MAINTENANCE SPECIFICATION (ELECTRICAL) SPEC



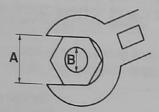
Starter motor	
Power output	0.40 kW
Armature coil resistance	0.0126-0.0154 Ω
Brush overall length	10.0 mm (0.39 in)
Limit	3.50 mm (0.14 in)
Brush spring force	5.52-8.28 N (563-844 gf, 19.87-29.80 oz)
Commutator diameter	22.0 mm (0.87 in)
Limit	21.0 mm (0.83 in)
Mica undercut (depth)	1.50 mm (0.06 in)
Fuel sender unit	
Sender unit resistance (full)	10.0-14.0 Ω
Sender unit resistance (empty)	267.0-273.0 Ω
Fuel injection sensor	
Crankshaft position sensor resistance	192-288 Ω
Intake air temperature sensor resistance	5700-6300 Ω at 0 °C (5700-6300 Ω at 32 °F)
Engine temperature sensor resistance	28500-31500 Ω at 0 °C (28500-31500 Ω at 32 °F)
Engine temperature sensor resistance	1818-2223 Ω at 75 °C (1818-2223 Ω at 167 °F)
Fuse(s)	
Main fuse	15.0 A



TIGHTENING TORQUES

GENERAL TIGHTENING TORQUE **SPECIFICATIONS**

This chart specifies tightening torques for standard fasteners with a standard ISO thread pitch. Tightening torque specifications for special components or assemblies are provided for each chapter of this manual. To avoid warpage, tighten multi-fastener assemblies in a crisscross pattern and progressive stages until the specified tightening torque is reached. Unless otherwise specified, tightening torque specifications require clean, dry threads. Components should be at room temperature.



- A. Distance between flats
- B. Outside thread diameter

A (nut)	B (bolt)	General tightening torques			
		N·m	kgf⋅m	lb·ft	
10 mm	6 mm	6	0.6	4.4	
12 mm	8 mm	15	1.5	11	
14 mm	10 mm	30	3.0	22	
17 mm	12 mm	55	5.5	41	
19 mm	14 mm	85	8.5	63	
22 mm	16 mm	130	13.0	96	

TIGHTENING TORQUES SPEC



ENGINE TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks
Cylinder head bolt (Long)	M8	4	Initial: 17 N·m (1.7 kgf·m, 13 lb·ft) Final: 33 N·m (3.3 kgf·m, 24 lb·ft)	Apply engine oil to the bearing surface Apply molybdenum grease to the thread
Cylinder head bolt (Socket head)	M8	2	24 N·m (2.4 kgf·m, 18 lb·ft)	
Spark plug	M12	1	18 N·m (1.8 kgf·m, 13 lb·ft)	
Cylinder head cover bolt	M55	2	18 N·m (1.8 kgf·m, 13 lb·ft)	
Cylinder head stud bolt (Install- ing Exhaust pipe)	M8	2	15 N·m (1.5 kgf·m, 11 lb·ft)	
Camshaft plate bolt	M6	2	8 N·m (0.8 kgf·m, 7.4 lb·ft)	-10
Sprocket cover breather plate bolt	M6	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)	-10
Cylinder bolts (Socket head)	M6	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)	energiants forti
Oil check bolt	M6	1	7 N·m (0.7 kgf·m, 5.2 lb·ft)	with gasket
Balancer gear weight nut	M12	1	55 N·m (5.5 kgf·m, 41 lb·ft)	-10
Timing chain guide stopper bolt	M6	2	8 N·m (0.8 kgf·m, 5.9 lb·ft)	-10
Valve adjusting screw locknut	M6	2	14 N·m (1.4 kgf·m, 10 lb·ft)	
Camshaft sprocket bolt	M10	1	60 N·m (6.0 kgf·m, 44 lb·ft)	
Camshaft sprocket cover bolt	M6	1	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Timing chain tensioner plug	M6	1	8 N·m (0.8 kgf·m, 5.9 lb·ft)	
Timing chain tensioner bolt	M6	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)	Apply Yamaha bond No. 1215 to screw thread
Oil pump assembly bolt	M6	3	7 N·m (0.7 kgf·m, 5.2 lb·ft)	-10
Engine oil drain plug	M12	1	20 N·m (2.0 kgf·m, 15 lb·ft)	
Oil filter element cover bolt	M6	3	10 N·m (1.0 kgf·m, 7.4 lb·ft)	The other same of
Intake manifold joint	M6	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Injector bolt	M6	1	5 N·m (0.5 kgf·m, 3.7 lb·ft)	Tighten until
Throttle body joint clamp bolt	M4	2	2 N·m (0.2 kgf·m, 1.5 lb·ft)	Tighten until contacting
Air filter case bolt	M6	3	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Air filter case cover screw	M5	6	4 N·m (0.4 kgf·m, 3.0 lb·ft)	
Exhaust pipe nut	M8	2	15 N·m (1.5 kgf·m, 11 lb·ft)	The state of the s
Muffler installing bolt	M8	1	20 N·m (2.0 kgf·m, 15 lb·ft)	
Muffler installing bolt (right side bottom)	M8	1	20 N·m (2.0 kgf·m, 15 lb·ft)	78 100 100163
Muffler installing bolt (left side bottom)	M8	1	20 N·m (2.0 kgf·m, 15 lb·ft)	
Muffler end cap bolt	M6	2	10 0 kafim 5 0 lhift)	
Muffler protector bolt	M6	5	8 N·m (0.8 kgf·m, 5.9 lb·ft)	

TIGHTENING TORQUES SPEC

Item	Thread size	Q'ty	Tightening torque	Roy
Left side crankcase bolt	M6	12	10 N·m (1.0 kgf·m, 7.4 lb·ft)	Remarks
AC magneto cover bolt	M6	9	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Clutch cover bolt	M6	13	10 N·m (1.0 kgf·m, 7.4 lb·ft)	1
Drive sprocket nut	M6	1	110 N·m (11.0 kgf·m, 81 lb·ft)	
Timing mark accessing screw	M14	1	3 N·m (0.3 kgf·m, 2.2 lb·ft)	
Crankshaft end accessing screw	M32	1	3 N·m (0.3 kgf·m, 2.2 lb·ft)	1
Drive sprocket cover bolt	M6	3	10 N·m (1.0 kgf·m, 7.4 lb·ft)	1
Starter clutch bolt	M8	3	30 N·m (3.0 kgf·m, 22 lb·ft)	10
Primary drive gear nut	M16	1		0
Clutch spring bolt	M6	4	80 N·m (8.0 kgf·m, 59 lb·ft)	
Locknut short clutch push rod	M6	1	8 N·m (0.8 kgf·m, 5.9 lb·ft)	
Clutch boss nut	M16	1	8 N·m (0.8 kgf·m, 5.9 lb·ft)	
Shift drum segment screw			75 N·m (7.5 kgf·m, 55 lb·ft)	
Stopper lever bolt	M6	1	12 N·m (1.2 kgf·m, 8.9 lb·ft)	-0
	M6	1	10 N·m (1.0 kgf·m, 7.4 lb·ft)	-0
Push lever assembly bolt	M8	1	12 N·m (1.2 kgf·m, 8.9 lb·ft)	
Oil pipe union bolt (On Crank- case)	M10	1	20 N·m (2.0 kgf·m, 15 lb·ft)	
Oil pipe union bolt (On Cylinder)	M8	1	17 N·m (1.7 kgf·m, 13 lb·ft)	-
Oil cooler mounting bolt	M6	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Oil cooler hoses bolts (Oil cooler side)	M6	4	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Oil cooler hoses bolts (engine side)	M6	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)	Track- No.
Stator coil bolt	M6	3	10 N·m (1.0 kgf·m, 7.4 lb·ft)	-10
Crankshaft position sensor bolt	M6	2	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
AC magneto rotor bolt	M10	1	Initial: 75 N·m (7.5 kgf·m, 55 lb·ft) Final: 55 N·m (5.5 kgf·m, 41 lb·ft)	See TIP
Neutral switch	M10	1	17 N·m (1.7 kgf·m, 13 lb·ft)	
Starter motor bolt	M6	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)	-111111
ingine temperature sensor	M8	1	9 N·m (0.9 kgf·m, 6.6 lb·ft)	and the same of
O ₂ sensor	M12	1	25 N·m (2.5 kgf·m, 18 lb·ft)	
earing retainer screw	M6	1	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
lutch cable holder bolt	M6	1	10 N·m (1.0 kgf·m, 7.4 lb·ft)	

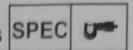
TIP

Tighten the AC magneto rotor bolt 75 N·m (7.5 kgf·m, 55 lb·ft) with a torque wrench. Loosen the AC magneto rotor bolt 180°-270° turn.

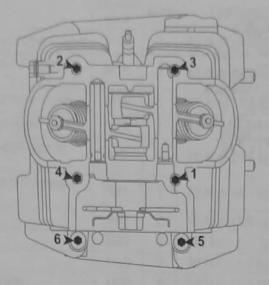
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Re-tighten the AC magneto rotor bolt 55 N·m (5.5 kgf·m, 41 lb·ft) with a torque wrench.

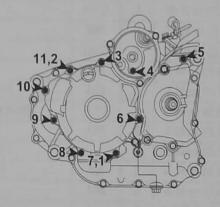
• When loosening and re-tightening the AC magneto rotor bolt, do not remove rotor assembly.



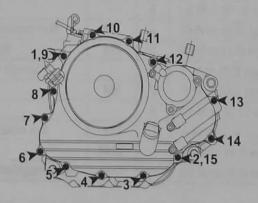
Cylinder head tightening sequence:



AC Magneto cover tightening sequence:

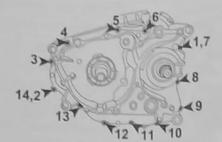


Clutch cover tightening sequence:





Crankcase tightening sequence:





CHASSIS TIGHTENING TORQUES

Item	Thread size	Q'ty	Tightening torque	Remarks	
Engine bracket and frame nut (front side)	M10	2	43 N·m (4.3 kgf·m, 32 lb·ft)	-US	
Engine bracket and engine nut (front side)	M10	2	43 N·m (4.3 kgf·m, 32 lb·ft)	-@H	
Engine and frame nut (rear lower side)	M10	1	43 N·m (4.3 kgf·m, 32 lb·ft)	-(3)-	
Engine and frame nut (rear upper side)	M10	1	43 N·m (4.3 kgf·m, 32 lb·ft)	-CED-	
Engine bracket and frame bolt (upper side)	M8	2	29 N·m (2.9 kgf·m, 21 lb·ft)	-©	
Engine bracket and engine nut (upper side)	M8	1	43 N·m (4.3 kgf·m, 32 lb·ft)	-63	
Upper bracket pinch bolt	M8	2	16 N·m (1.6 kgf·m, 12 lb·ft)		
Steering stem nut	M22	1	110 N·m (11 kgf·m, 81 lb·ft)		
Lower bracket pinch bolt	M10	2	30 N·m (3.0 kgf·m, 22 lb·ft)		
Lower ring nut (first tightening)	M25	1	33 N·m (3.3 kgf·m, 24 lb·ft)	See TIP	
Lower ring nut (final tightening)	M25	1	22 N·m (2.2 kgf·m, 16 lb·ft)	See TIP	
Front fork cap bolt	M30	2	23 N·m (2.3 kgf·m, 17 lb·ft)		
Front fork damper rod bolt	M10	2	30 N·m (3.0 kgf·m, 22 lb·ft)		
Upper handlebar bolt	M8	4	23 N·m (2.3 kgf·m, 17 lb·ft)		
Rear view mirror nut	M10	4	22 N·m (2.2 kgf·m, 16 lb·ft)		
Clutch lever nut	M6	1	6 N·m (0.6 kgf·m, 4.4 lb·ft)		
Front fender bolt (hexagon bolt)	M6	2	7 N·m (0.7 kgf·m, 5.2 lb·ft)		
Front fender bolt (button head bolt)	M6	2	6 N·m (0.6 kgf·m, 4.4 lb·ft)		
Main switch screw	M6	2	7 N·m (0.7 kgf·m, 5.2 lb·ft)		
Meter assembly screw	-	3	3 N·m (0.3 kgf·m, 2.2 lb·ft)		
Headlight mounting upper bolt	M6	2	4 N·m (0.4 kgf·m, 3.0 lb·ft)		
Headlight mounting side bolt	M6	2	4 N·m (0.4 kgf·m, 3.0 lb·ft)		
Headlight upper cover screw	-	2	1.8 N·m (0.18 kgf·m, 1.3 lb·ft)		
License plate bracket and windshield screw	-	4	0.7 N·m (0.07 kgf·m, 0.5 lb·ft)		
Headlight side cowl screw	-	4	1.8 N·m (0.18 kgf·m, 1.3 lb·ft)		
Headlight stay and lower bracket bolt	M6	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)		
Headlight stay mounting bolt	M6	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)		
Headlight stay and bracket screw	1 -	2	2 N·m (0.2 kgf·m, 1.5 lb·ft)		
Grip end bolt	M6	2	4 N·m (0.4 kgf·m, 3.0 lb·ft)		
Throttle grip cap screw	-	2	1.7 N·m (0.17 kgf·m, 1.3 lb·ft)		
Throttle body and throttle cable nut	M6	2	4 N·m (0.4 kgf·m, 3.0 lb·ft)		
Swingarm pivot shaft nut	M12	1	62 N·m (6.2 kgf·m, 46 lb·ft)		
Rear shock absorber and swingarm nut	M12	1	60 N·m (6.0 kgf·m, 44 lb·ft)		

TIGHTENING TORQUES

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Item	Thread size	Q'ty	Tightening torque	Rema
Rear shock absorber and frame nut	M12	1	40 N·m (4.0 kgf·m, 30 lb·ft)	- Ilai
Mud protector assembly bolt	M6	4	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Mud guard and stay bolt	M6	4	8 N·m (0.8 kgf·m, 5.9 lb·ft)	
Rear stay assembly bolt (LH & RH)	M6	8	8 N·m (0.8 kgf·m, 5.9 lb·ft)	
Lower chain cover bolt	M6	2	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Rear fender and swingarm bolt	M6	3	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Fuel tank and fuel pump bolt	M5	6	4 N·m (0.4 kgf·m, 3.0 lb·ft)	
Fuel tank and frame bolt	M6	2	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Fuel tank bracket and frame bolt	M6	2	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Fuel tank and fuel tank bracket bolt	M6	2	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Horn and frame bolt	M6	1	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Ignition coil and frame bolt	M5	2	4 N·m (0.4 kgf·m, 3.0 lb·ft)	
Rectifier/regulator and frame bolt	M6	2	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Side cover and frame screw	-	4	1.8 N·m (0.18 kgf·m, 1.3 lb·ft)	
Rear side cover and frame bolt	M6	2	8 N·m (0.8 kgf·m, 5.9 lb·ft)	
Assist grip and frame bolt	M8	4	21 N·m (2.1 kgf·m, 15 lb·ft)	
Seat and frame bolt	M6	2		1000
Rear license plate light screw	-	1	7 N·m (0.7 kgf·m, 5.2 lb·ft) 0.7 N·m (0.07 kgf·m, 0.5 lb·ft)	
Rear reflector and rear fender cover nut	M5	1	1.5 N·m (0.15 kgf·m, 1.1 lb·ft)	
Seat lock and frame bolt	M6	2	7 N·m (0.7 kgf·m, 5.2 lb·ft)	Section 1
Battery box and frame bolt	M6	2	8 N·m (0.8 kgf·m, 5.9 lb·ft)	
Front wheel axle nut	M14	1	38 N·m (3.8 kgf·m, 28 lb·ft)	-
Rear wheel axle nut	M14	1	59 N·m (5.9 kgf·m, 44 lb·ft)	
Drive chain puller locknut	M8	2	14 N·m (1.4 kgf·m, 10 lb·ft)	A COLUMN
Rear wheel sprocket nut	M8	6	43 N·m (4.3 kgf·m, 32 lb·ft)	
Front brake caliper bolt	M10	2	35 N·m (3.5 kgf·m, 26 lb·ft)	
Front brake caliper sliding pin bolt (long)	-	1	23 N·m (2.3 kgf·m, 17 lb·ft)	-
Front brake caliper sliding pin bolt (small)	1 -	1	14 N·m (1.4 kgf·m, 10 lb·ft)	
Front brake disc bolt	M8	5	23 N·m (2.3 kgf·m, 17 lb·ft)	
Front brake master cylinder holder bolt	M6	2		
Brake pedal bolt	M10	1	10 N·m (1.0 kgf·m, 7.4 lb·ft) 10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Front brake caliper bleed screw	2-1	1	14 N·m (1.4 kgf·m, 10 lb·ft)	10 619

TIGHTENING TORQUES SPEC



Item	Thread size	Q'ty	Tightening torque	Remarks
Front brake master cylinder cap screw	-	2	1.5 N·m (0.15 kgf·m, 1.1 lb·ft)	
Front brake hose union bolt	M10	2	24 N·m (2.4 kgf·m, 18 lb·ft)	
Brake hose holder and front fork outer tube bolt	M6	1	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Brake hose holder and lower bracket bolt	M6	1	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Footrest and frame bolt	M8	2	28 N·m (2.8 kgf·m, 21 lb·ft)	THE REAL PROPERTY.
Sidestand nut	M10	1	44 N·m (4.4 kgf·m, 32 lb·ft)	4
Centerstand nut	M10	2	60 N·m (6.0 kgf·m, 44 lb·ft)	The same
Shift pedal bolt	M10	1	25 N·m (2.5 kgf·m, 18 lb·ft)	1000
Shift arm and shift shaft bolt	M6	1	14 N·m (1.4 kgf·m, 10 lb·ft)	
Footrest pin screw	M8	2	10 N·m (1.0 kgf·m, 7.4 lb·ft)	
Footrest cover screw	M5	4	4 N·m (0.4 kgf·m, 3.0 lb·ft)	
Footrest plate screw	-	4	8 N·m (0.8 kgf·m, 5.9 lb·ft)	
Rear brake switch stay bolt	M6	1	10 N·m (1.0 kgf·m, 7.4 lb·ft)	The State of
Front brake lever nut	M7	1	6 N·m (0.6 kgf·m, 4.4 lb·ft)	
Rear brake disc bolt	M8	3	23 N·m (2.3 kgf·m, 17 lb·ft)	
Rear brake caliper sliding pin bolt (small)	-	1	12 N·m (1.2 kgf·m, 8.7 lb·ft)	
Rear brake pad pin bolt		2	17 N·m (1.7 kgf·m, 13 lb·ft)	
Rear brake caliper sliding pin bolt (long)	-	1	22 N·m (2.2 kgf·m, 16 lb·ft)	
Rear brake caliper bleed screw	M8	1	5 N·m (0.5 kgf·m, 3.6 lb·ft)	
Rear brake hose holder bolt	M6	1	7 N·m (0.7 kgf·m, 5.2 lb·ft)	
Rear brake hose union bolt	M10	2	30 N·m (3.0 kgf·m, 22 lb·ft)	-C TOWN
Rear brake master cylinder bolt	M8	2	23 N·m (2.3 kgf·m, 17 lb·ft)	
Rear brake fluid reservoir cap screw	-	2	1.5 N·m (0.15 kgf·m, 1.1 lb·ft)	
Rear brake fluid reservoir bolt	M6	1	7 N·m (0.7 kgf·m, 5.2 lb·ft)	10 60-1

TIP

Tighten the lower steering ring nut 33 N·m (3.3 kgf·m, 24 lb·ft) with a torque wrench.

Turn the steering shaft to left or right several times and make sure the steering shaft turns smoothly. Loosen the lower steering ring nut 1/4 turn.

Re-tighten the lower steering ring nut to 22 N·m (2.2 kgf·m, 16 lb·ft) with a torque wrench.

LUBRICATION POINTS AND LUBRICANT TYPES SPEC

LUBRICATION POINTS AND LUBRICANT TYPES ENGINE

Lubrication point	Lubricant
Bearings	-0
Oil seal lips	-
Cylinder head bolts and washers (M8 bolt)	- (1)
Cylinder head bolts (M6 bolt)	0
Camshaft bearings	-0
Connecting rod big end and thrust surface	0
Piston pin, piston surface and piston rings	-0
Camshaft lobes	-0
Valve stems (intake and exhaust)	-0
Valve stem ends (intake and exhaust)	-0
Valve stem seals (intake and exhaust)	⊸⊙
Rocker arm shaft	-0
Rocker arm inner surfaces	⊙
Oil pump rotors (inner/outer)	-0
Oil pump shaft	-0
Oil element cover O-rings	-COM
Intake manifold O-ring	-(s)-(
Injector O-ring	-(15)-1
Starter clutch roller and starter wheel gear boss	-0
Starter idle shaft/starter idle gear thrust surface	→ Q
Starter clutch gear inner surface and thrust surface	-0
Clutch push lever	- □
Primary driven gear inner surface	-0
Clutch push rod (short and long) and ball	-0
Clutch boss nut and lock washer contact surface	-0
Transmission gear (wheel and pinion) and collar	-0
Shift fork and shift fork guide bar	→0
Shift drum	-0
Shift shaft	
Drive axle and bearing contact surface	-0
Primary sheave nut thread and conical spring washer	⊸ 0
Timing mark accessing screw O-ring	-0
Crankshaft end accessing screw O-ring	-40-4
Oil level gauge O-ring	-43-4
Starter motor O-ring	-034
	-

LUBRICATION POINTS AND LUBRICANT TYPES SPEC

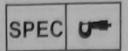


Crankshaft position sensor/stator assembly lead grommet	Yamaha bond No. 1215B
Timing chain tensioner bolts	Yamaha bond No. 1215B
Crankcase cover bolts	Yamaha bond No. 1215B
Crankcase mating surface	Yamaha bond No. 1215B
Oil cooler hose O-ring	-(3)-(
Camshaft cover O-ring	-69-1
Cylinder head valve cover O-ring	-(3)-(
Rocker arm shaft O-ring	-(3)-(

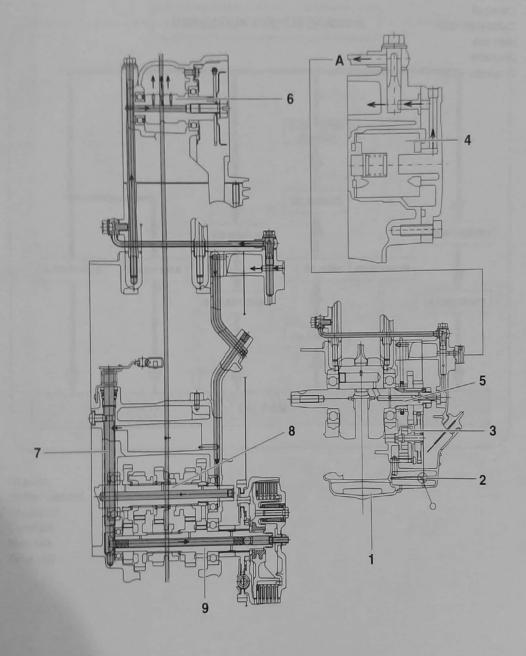
LUBRICATION POINTS AND LUBRICANT TYPES SPEC

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Lubrication point	Lubricant
Front wheel oil seal lip	-
Rear wheel drive hub oil seal lip	LS
Rear wheel drive hub mating surface	-
Brake pedal pivoting point	-
Brake caliper bracket boots inner surface	-(3)
Throttle grip tube guide inner surface and throttle cable end	-(15)
Clutch cable end/clutch lever pivot bolt outer surface	-
Brake lever pivoting points and metal to metal moving parts	-(13)-
Steering bearings and oil seals	-
Rear shock absorber collar	-(13)-
Rear shock absorber oil seal lip	-COH
Pivot shaft outer surface	-(13)-
Swingarm bushing outer surface	-(3)-
Swingarm dust cover lips	-CD-
Centerstand pivot shaft	-LS)-
Centerstand bracket and spring contact surface	-CLS)-I
Sidestand pivoting point, metal to metal moving parts and collar outer surface	-(B)-
Footrest pivoting point	
Passenger footrest pivoting point	
Shift pedal pivoting point	-(15)-
Engine mounting bolts and nuts	-LS

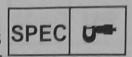


LUBRICATION SYSTEM DIAGRAMS



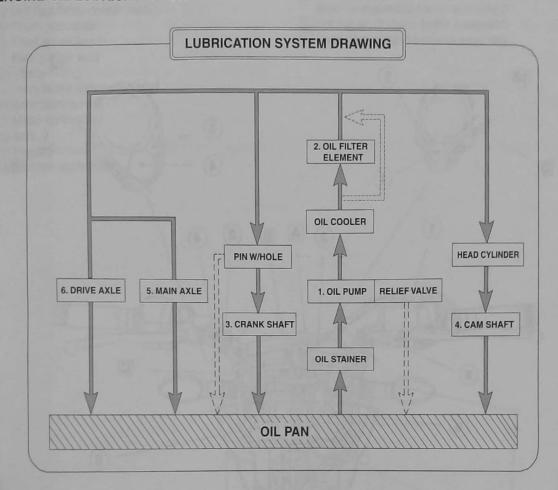
LUBRICATION SYSTEM DIAGRAMS SPEC 1. Oil pan 2. Oil strainer 3. Oil pump assembly 4. Oil filter 5. Crankshaft 6. Camshaft 7. Clutch push lever 8. Main axle 9. Drive axle A. To cylinder head

LUBRICATION SYSTEM CHART AND DIAGRAMS SPEC

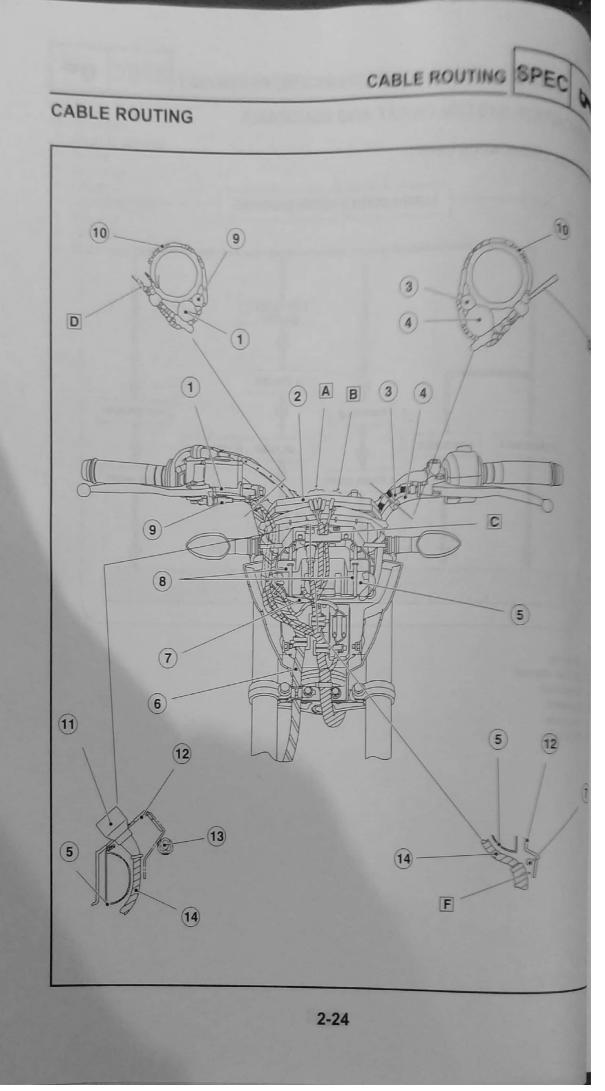


LUBRICATION SYSTEM CHART AND DIAGRAMS

ENGINE OIL LUBRICATION CHART

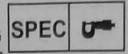


- 1. Oil pump
- 2. Oil filter element
- 3. Crankshaft
- 4. Camshaft
- 5. Main axle
- 6. Drive axle



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CABLE ROUTING SPEC



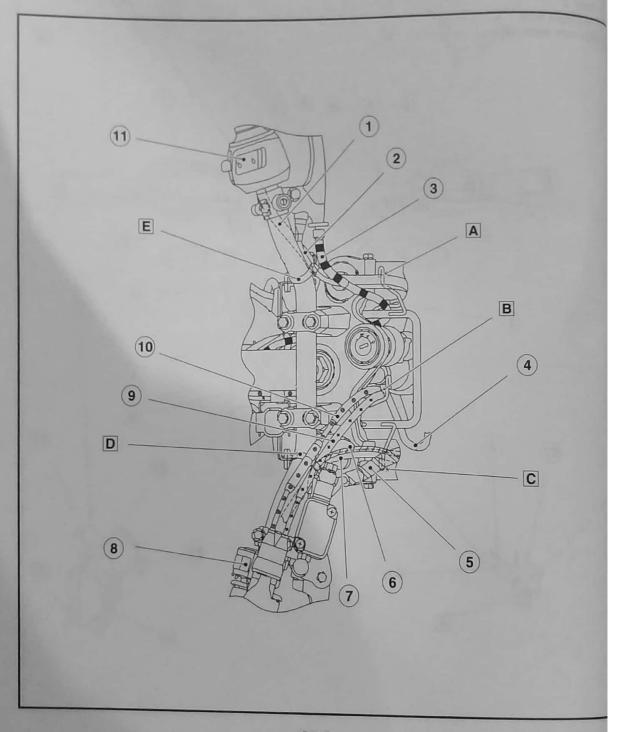
- D Right handlebar switch lead
- 2) Meter assembly
- 3 Clutch switch lead
- 1 Left handlebar switch lead
- ⑤ Cover connector
- 6 Front brake hose
- Main switch lead
- ® Clamp
- Front brake light switch lead
- 10 Band switch cord
- 1 Meter connector
- 12 Stay, 2
- (3) Headlight lead
- (4) Harness assembly

- A To front turn signal light
- B To auxiliary light
- © Front turn signal LH/RH and auxiliary light lead. Shall be passed to the hole of stay 2.
- D Set the tip of clamp to the backward.
- E Shall pass behind harness assembly.



- ① Left handlebar switch lead
- Clutch switch lead
- (I) Clutch cable
- (Main switch lead
- (5) Front brake hose
- Front brake light switch assembly
- Right handlebar switch lead
- ® Right handlebar switch
- Throttle cable (Return side)
- Throttle cable (Pull side)
- ① Left handlebar switch

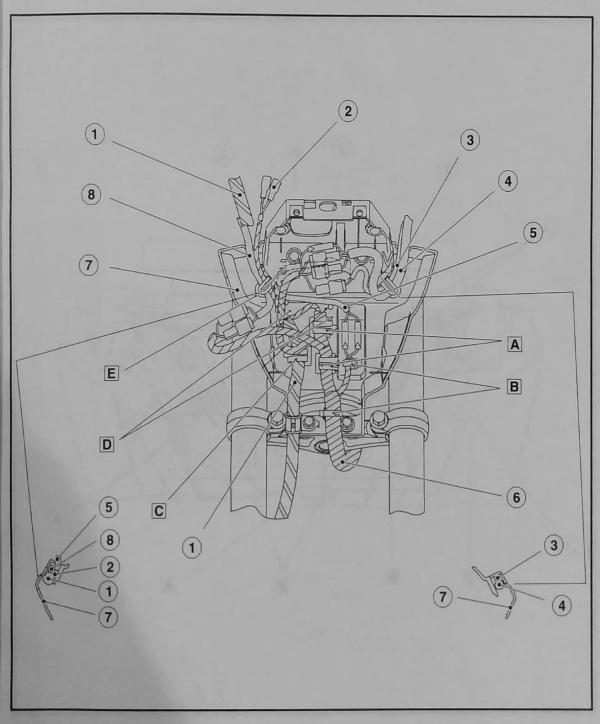
- A Left handlebar switch lead and clutch lead pass to front side of guide of stay.
- B Throttle cable (Pull side) and throttle (Return side) pass to guide of stay.
- Right handlebar switch lead, front brake is switch lead and brake hose pass to front side guide of stay.
- D Right handlebar switch lead, front brake light switch lead shall be fixed to handlebar by clarge
- E Clutch switch lead and left handlebar switch lead shall be fixed to handlebar by clamp.

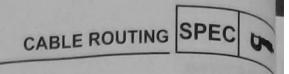


- ① Front brake hose
- ② Front brake light switch assembly lead
- ③ Clutch switch lead
- 4 Left handlebar switch lead
- Main switch lead
- (6) Harness assembly
- (7) Stay, 2
- ® Right handlebar switch lead

- A Harness shall be passed to hook of stay, 2.

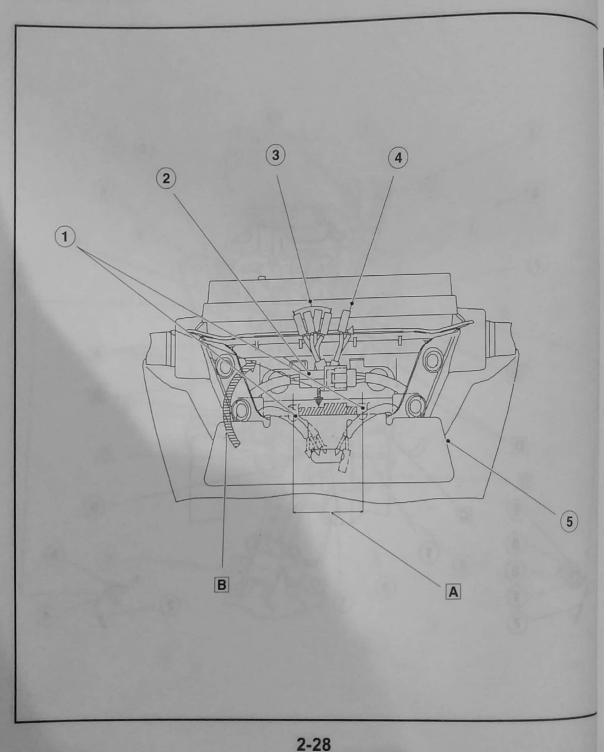
 B Clamp shall be inserted in the hole of stay, 2.
- C Brake hose 1 shall be passed to hook of stay, 2.
- D Pass main switch lead on the boss of stay, 2.
- E Main switch lead shall be passed in this hole to front side.





- ① Bracket rib
- ② Headlight connector
- ③ Front turn signal light lead
- Auxiliary light lead
 Connector cover

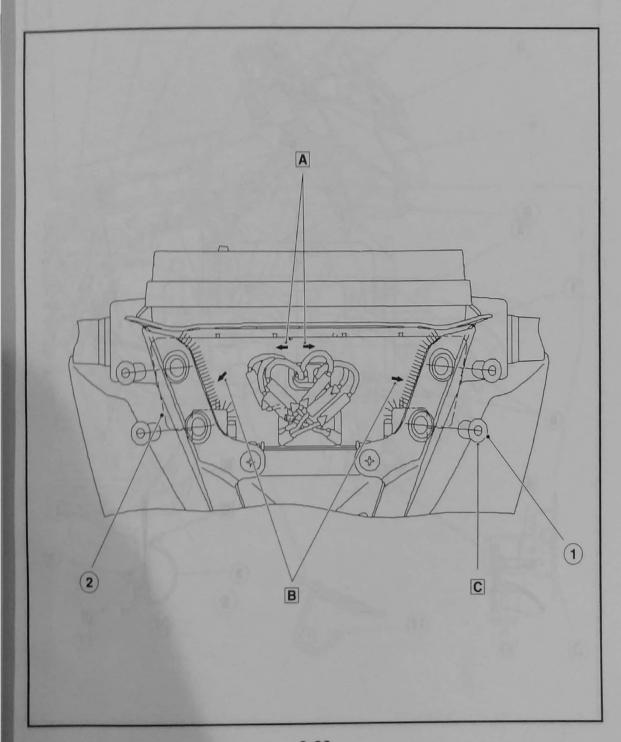
- After headlight connector is connected headlight connector between the rib of bracket headlight connector. Connector connector connector.
- headlight connector. Connector. Connector. cover shall be raised up.



① Nut

Cover connector

- After these terminals are connected, distribute every 3 to place flatly.
- B Both ends of connector cover shall be inserted.



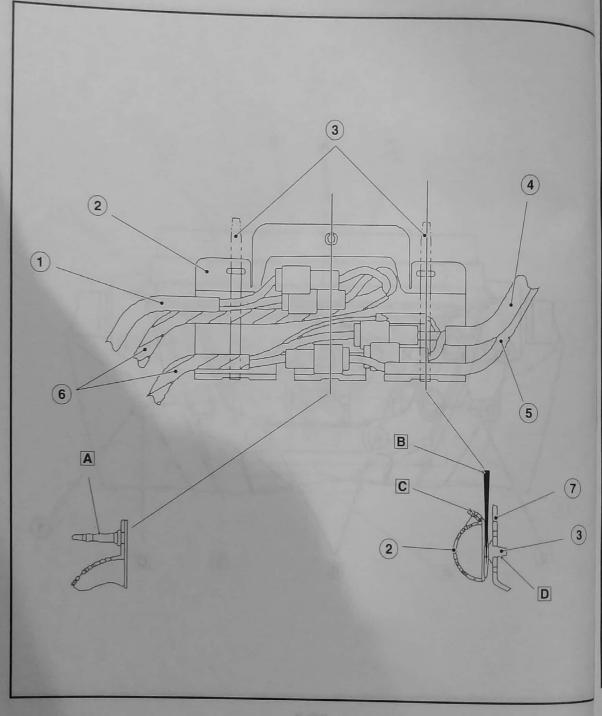
CABLE ROUTING SPEC

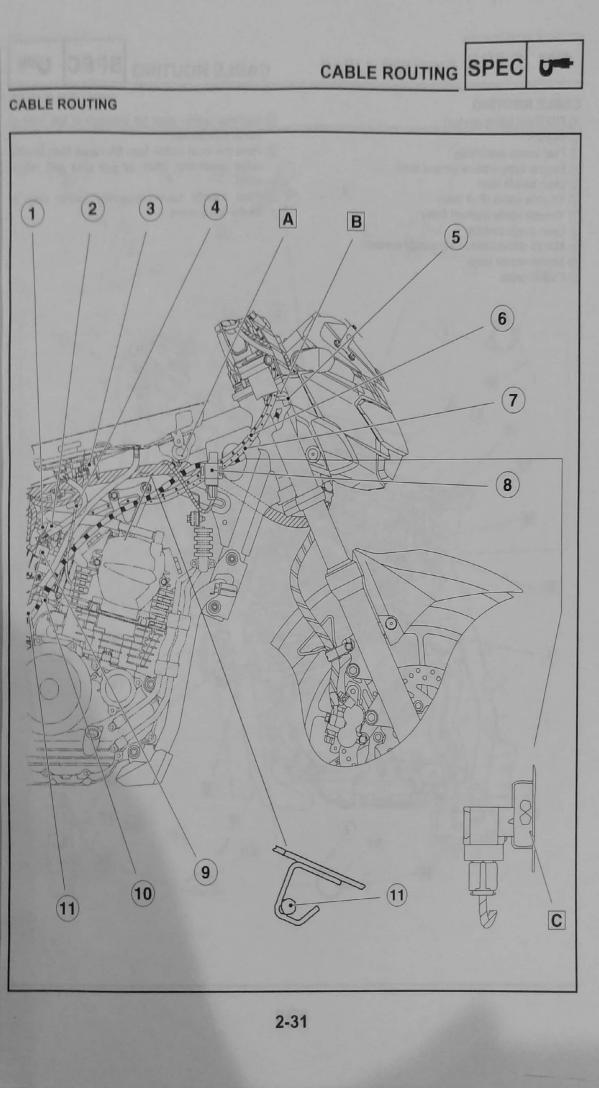


- ① Right handlebar switch lead
- ② Connector cover
- ③ Clamp
- (4) Left handlebar switch
- (5) Clutch switch lead
- 6 Harness assembly
- TStay, 2

- After wrapping connector, insert prominence in
- hole for fixing.

 B Set the tip of clamp to the upper side. Tip g
- Clamp shall pass the hole of connector cover.
- D Clamp shall be inserted in the hole of stay, 2.



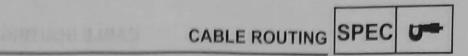


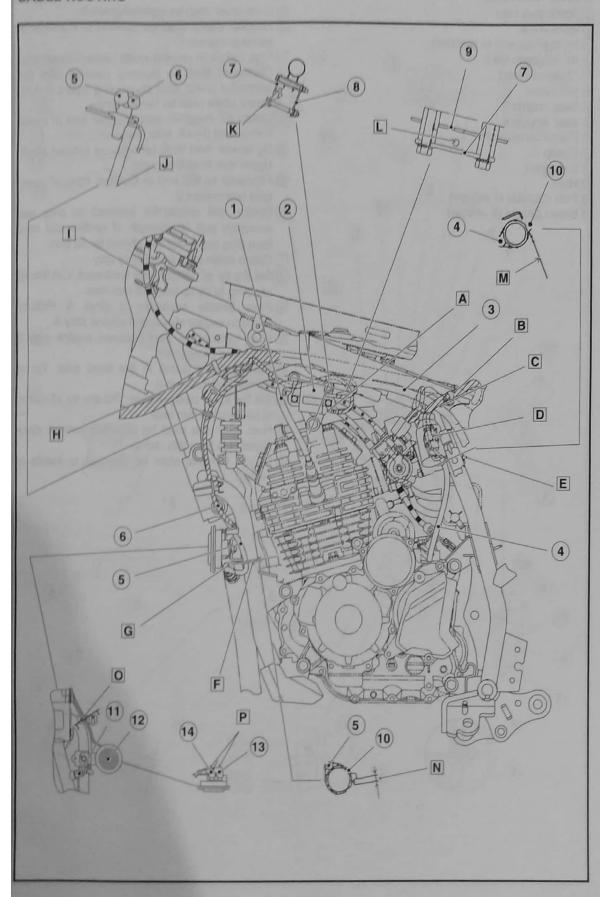
CABLE ROUTING SPEC



- ① FID (Fast idling device)
- 2 Injector
- Tuel pump assembly
- (4) Engine temperature sensor lead
- Main switch lead
- (6) Throttle cable (Pull side)
- Throttle cable (Return side)
- ® Lean angle sensor
- MAQS (Modularized air quality sensor)
- 10 Starter motor lead
- ① Clutch cable

- A Harness clamp shall be inserted in the hole
- B Pass the main switch lead frontward than through the same of the cable assembly. (Both of pull side and re-
- © Pass throttle cable assembly inside stay frame component.





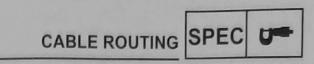
CABLE ROUTING SPEC

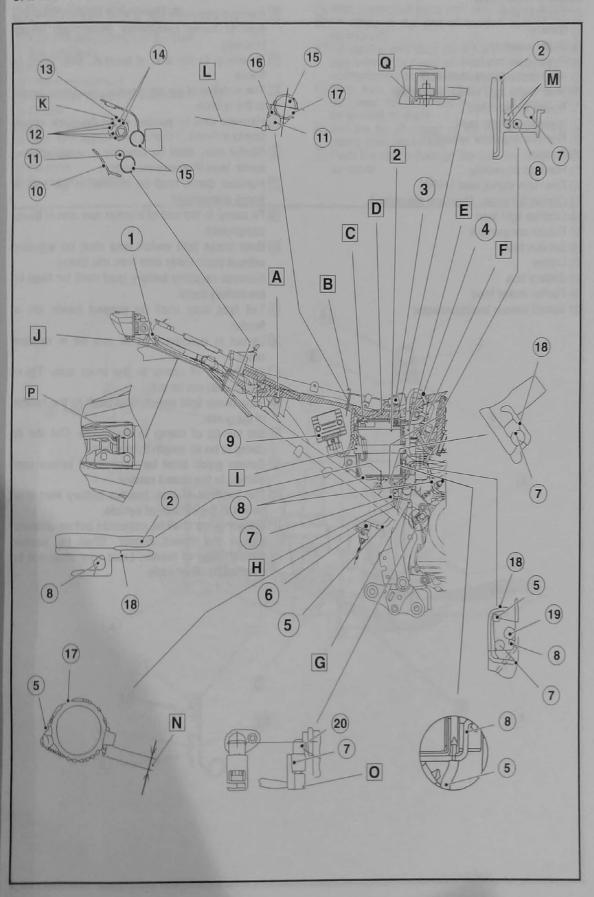


- ① Spark plug lead
- ② Ignition coil
- 3 Hose (Fuel tank to canister)
- 4 AC magneto lead
- ⑤ O₂ sensor lead
- 6 Horn lead
- Stay, engine 3
- ® Stay, engine 4
- Frame component
- (1) Clamp
- 1 O2 sensor
- 12 Horn
- 13 Pink (Outside of vehicle)
- (4) Brown (Inside of vehicle)

- A Lead cover shall be inserted properly.
- Elead cover shall be inserted in the hole of the
- frame component.

 © Pipe 2 shall be passed inside harness assembly covered with © Connector shall be properly covered with connector cover, after connecting layout in con nector cover shall be random order.
- E Clamp AC magneto lead to upper side of frame component (Hook, side cover, 1).
- F O₂ sensor lead shall be adjusted without slack Upper side from this clamp.
- © Fit clamp to the end of bracket, horn of down tube component 2.
- ⊞ Ignition coil should be screwed to plug ca assembly pull off strength of ignition coil core from plug cap assembly should be 30 mm.
- Clutch cable pass to guide of stay.
- J Set the tip of clamp to the backward. Cut the tip of clamp to be tip length 5 mm max.
- K Pass throttle assembly 2 (Pull & Return between engine stay 3 and engine stay 4.
- L Pass ignition coil lead between engine stay and frame component.
- M Set the tip of clamp to the inner side. Tip clamp shall not be cut.
- N Set the tip of clamp inside. Cut the tip of clam to be length 5 mm max.
- O Horn lead wire shall be adjusted without slad upper side from this clamp.
- P L-Type terminal shall be directed to inside of vehicle.





- 1 Tail light lead
- ② Battery
- ③ Relay assembly
- Positive battery lead
- (5) Rear brake light switch lead
- 6 Rear brake light switch assembly
- Speed sensor lead
- ® Negative battery lead
- Rectifier regulator assembly
- (ii) Fender
- (I) Harness assembly
- Rear turn signal lead LH/RH
- (3) Connector cover, (harness assembly)
- (4) License light lead
- (6) Frame component
- ® Service tool
- (7) Clamp
- ® Battery box
- Starter motor lead
- ② Speed sensor lead connector

- A Harness assembly clamp shall be inserted in the same component (Rear right) hole of frame component (Rear right fen bracket)
- B Fit clamp to the end of bracket, tank fitting
- Trame.

 The terminal of negative battery lead shall be a to the upside.
- D Harness shall be passed along the guide of b tery box.
- E Starter relay shall be properly covered with cover, lead (harness assembly)
- F Harness clamp shall be inserted in the hole frame component.
- G Fit clamp to the end of bracket rear arm of fran component.
- H Rear brake light switch lead shall be adjuste without slack lower side from this clamp.
- the battery band.
- J Tail light lead shall be passed inside pin fender.
- K Layout in connector cover can be in rando order.
- ☐ Set the tip of clamp to the inner side. Tip clamp shall not be cut.
- M Rear brake light switch lead push to the botto of the guide.
- N Set the tip of clamp to the inside. Cut the clamp to be tip length 5 mm max.
- O Sensor guide shall be assembled before con necting to the speed sensor.
- The terminal of wire, positive battery lead sha be set to the outside of vehicle.
- P Sensor guide shall be assemble before connect ing to the speed sensor. Shall be passe through hole of fender. Lead wire shall not b pinched by other parts.

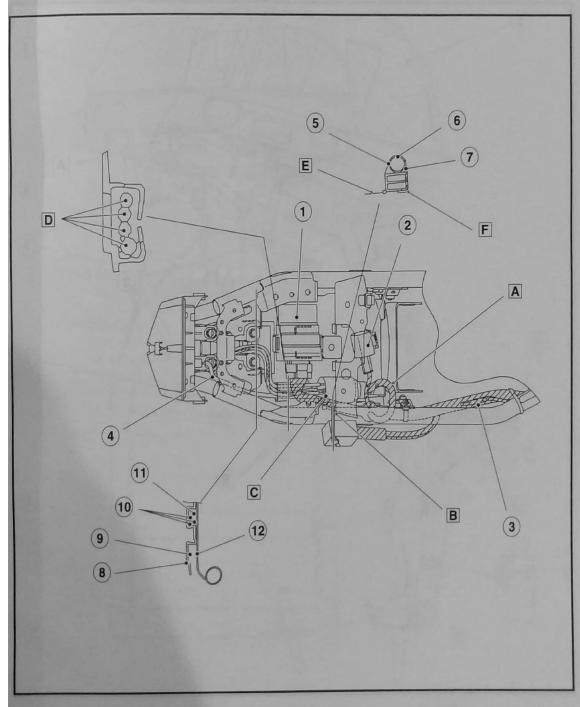
CABLE ROUTING SPEC

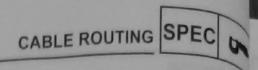


- 1) Engine control unit assembly
- 2) Turn signal relay assembly
- ③ Yamaha diagnostic tool coupler
- (4) Tail light lead
- (5) Clamp
- (6) Frame component
- (7) Connector cover (Harness assembly)
- ® Fender
- Tail light lead
- Rear turn signal lead (LH/RH), License plate light lead
- 11 Channel
- 12 Frame component

- After connected pass front side of rib in fender.

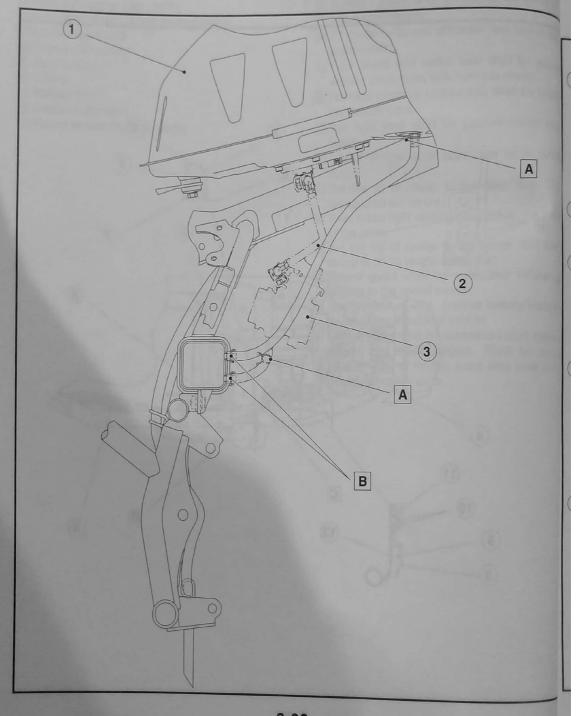
 B Fit clamp to the end of bracket seat of frame component.
- © Connector and plug shall be properly covered with connector cover after connecting. Layout in connector cover shall be in random order.
- D Rear turn signal lead (LH/RH), License plate light lead, tail light lead in guide of fender shall be in random order.
- E Set the tip of clamp to the lower side. Tip of clamp shall not be cut.
- F Pass the clamp through the hole on the connector cover.

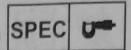




- ① Fuel tank assembly
- ② Fuel hose
- ③ Throttle body assembly

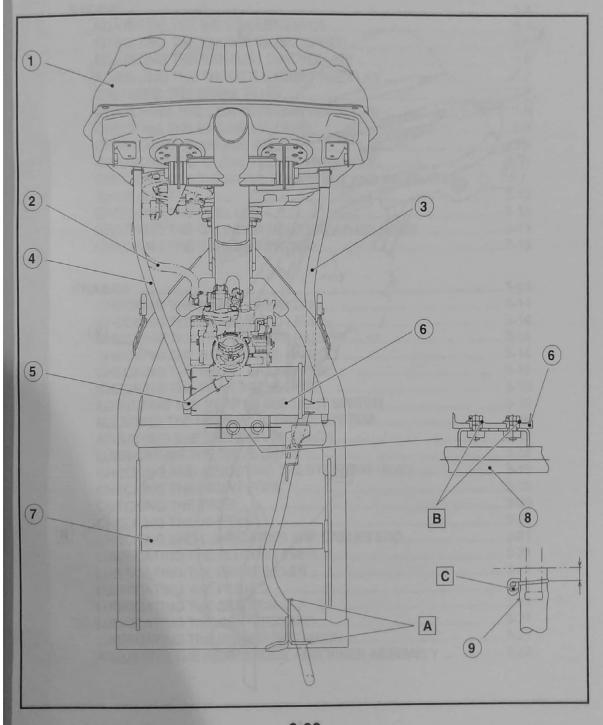
- A Orientation of clip knob shall be backside of vehicle.
- Orientation of clip knob shall be inside of vehicle.

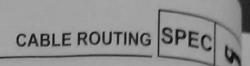




- 1 Fuel tank assembly
- ② Fuel hose
- ③ Breather hose
- (4) Canister hose (fuel tank to canister)
- (5) Canister hose (canister to throttle body)
- 6 Canister
- Rear arm assembly

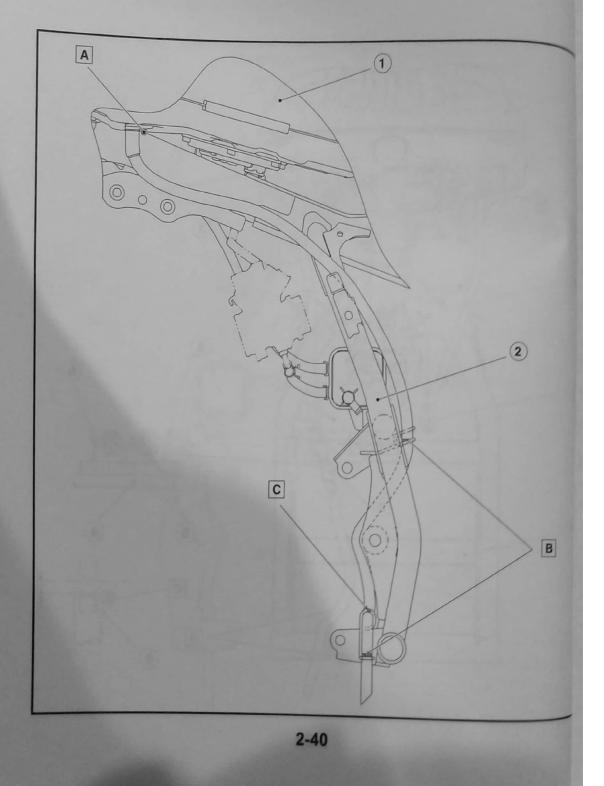
- ® Frame component
- (9) Spool
- A Pass the hose through the guide of frame component,
- B Shall be installed forward of the vehicle with the flange of vehicle.
- Install clip so that it will not set on spool of nipple.





- ① Fuel tank assembly
- ② Frame component
- A Orientation of clip knob shall be backside of the vehicle.
- Fit the white paint of hose to the guide of a component.
- component.

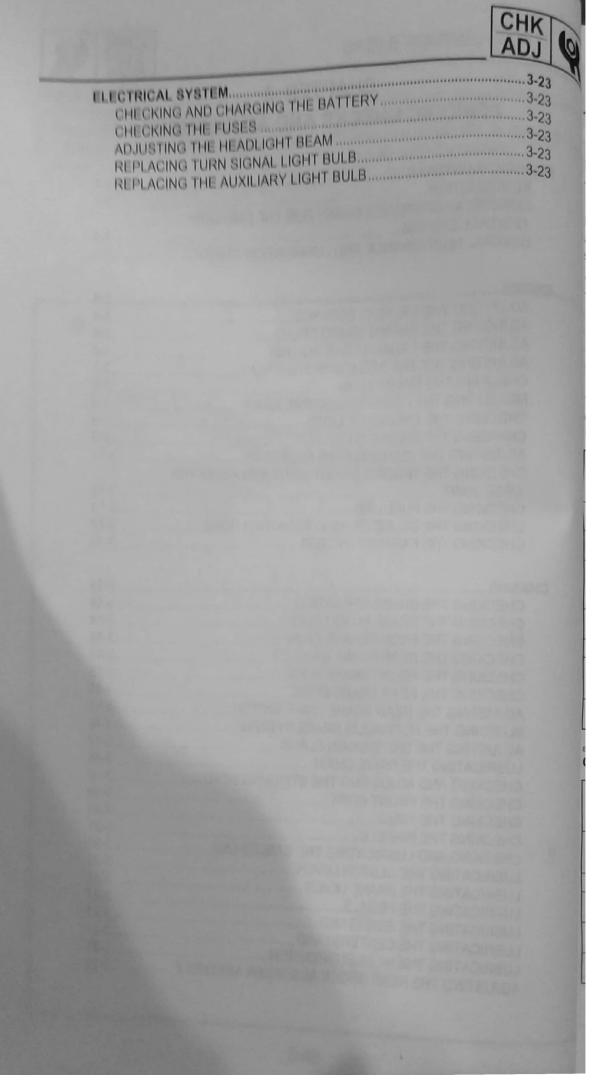
 © White paint of hose shall be directed to up, on guide of frame component.





CHAPTER 3 PERIODIC CHECKS AND ADJUSTMENT

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PERIODIC MAINTENANCE



PERIODIC MAINTENANCE

INTRODUCTION

This chapter includes all information necessary to perform recommended checks and adjustments. If followed, these preventive maintenance procedures will ensure more reliable vehicle operation, a longer service life and reduce the need for costly overhaul work. This information applies to vehicles already in service as well as to new vehicles that are being prepared for sale. All service technicians should be familiar with this entire chapter.

žΑ				

TIP

- The annual checks must be performed every year, except if a kilometer-based maintenance is performed instead.
- From 25000 km (15000 mi), repeat the maintenance intervals starting from 5000 km (3000 mi).
- Items marked with an asterisk should be performed by a Yamaha dealer as they require special tools, data and technical skills.

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PERIODIC MAINTENANCE CHART FOR THE EMISSION CONTROL SYSTEM

					ODOMETER READING						
N	О.	ITEM CHECK OR MAINTENANCE JO		1000 km (600 mi)	5000 km (3000 mi)	10000 km (6000 mi)	15000 km (9000 mi)	20000 km (12000 mi)	25000 km (15000 mi)		
1		Fuel line	Check fuel hoses for cracks or damage.	1	1	1	1	1	1		
2		Fuel filter	Check condition. Replace if necessary.			1		1			
3		Spark plug	Check condition. Clean and regap.	1	1	1	1	1	1		
			Replace.	Every 15000 km (9000 mi)							
4		Valves	Check valve clearance. Adjust if necessary.	1	1	1	1	1	1		
5		Fuel injection	Adjust engine idling speed.	1	1	1	1	1	1		
6		Exhaust system	Check for leakage. Tighten if necessary. Replace gasket(s) if necessary.		E	Every 10000	km (6000	mi)			
7		Evaporative emis- sion control system	Check control system for damage. Replace if necessary.		1	1		1			

CALITUGGO

GENERAL MAINTENANCE AND LUBRICATION CHART

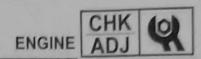
ī				ODOMETER READING						
NO.		ITEM	CHECK OR MAINTENANCE JOB	1000 km (600 mi)	5000 km (3000 mi)	10000 km (6000 mi)	15000 km (9000 mi)	20000 km (12000 mi)	25000 km (15000 mi)	
1		Diagnostic system check	Perform dynamic inspection using Yamaha diagnostic tool. Check the error codes.	1	1	1	1	1	1	
2		Air filter element	Replace.	Every 15000 km (9000 ml)						
3		Air filter case check hose	• Clean.	1	1	1	1	1	1	
4		Battery	Check voltage. Charge if necessary.	1	V	1	1	1	1	
5	1	Clutch	Check operation. Adjust.	1	1	1	1	1	1	

				ODOMETER READING							
N	0.	O. ITEM	CHECK OR MAINTENANCE JOB	1000 km (600 ml)	5000 km (3000 ml)	10000 km (6000 ml)	15000 km (9000 mi)	20000 km (12000 mi)			
6		Front brake	Check operation, fluid level and vehicle for fluid leakage.	1	1	4	4	1			
		Tont brake	Replace brake pads. Whenever worn to the limit.								
7		Rear brake	Check operation, fluid level and vehicle for fluid leakage.	1	4	1	1	1			
			Replace brake pads.	Whenever worn to the limit							
8		Brake hose	Check for cracks or damage. Check for correct routing and clamping.	V	1	√	1	4			
			Replace.	Every 4 years							
9		Brake fluid	Change.			Every 2	years				
0		Wheels	Check runout and for damage.	1	1	√	4	1			
1		Tires	Check tread depth and for damage. Replace if necessary. Check air pressure. Correct if necessary.	1	√	V	1	1			
2		Wheel bearings	Check bearing for looseness or damage. Replace if necessary.	1	1	√	1	1			
			Lubricate with lithium-soap-based grease.	Every 10000 km (6000 ml)							
3	*	Swingarm	Check operation and for excessive play.	√	√	4	√	√			
-			Lubricate with lithium-soap-based grease.	Every 10000 km (6200 mi)							
4		Drive chain	Check chain slack, alignment and condition. Adjust and lubricate chain with a special O-ring chain lubricant thoroughly.	Every 500 km (300 mi) and after washing the motorcy riding in the rain or riding in wet areas							
5 ,		Steering bearings	Check bearing play and steering for roughness.	√	1	1	1	V			
			Lubricate with lithium-soap-based grease.	Every 10000 km (6200 ml)							
	-	Chassis fasteners	Make sure that all nuts, bolts and screws are properly tightened.	√	1	1	1	1			
		Brake lever pivot shaft	Lubricate with silicone grease.	√	1	1	1	√			
		Brake pedal pivot shaft	Lubricate with lithium-soap-based grease.	√	1	V	V	V			
		Clutch lever pivot shaft	Lubricate with lithium-soap-based grease.	√	√	1	1	V			
		Shift pedal pivot shaft	Lubricate with lithium-soap-based grease.	1	√	1	1	1			
		Sidestand, center- stand	Check operation. Lubricate with lithium-soap-based grease.	V	1	1	1	V			
*	F	Front fork	Check operation and for oil leakage. Repair if necessary.	1	1	1	1	1			
			Replace oil.		Eve	ry 10000 kn	n (6000 mi)				
*		shock absorber as- embly	Check operation and shock absorber for oil leakage.	4	1	1	1	1			
	E	ngine oil	Change. (See page 3-10.) Check vehicle for oil leakage.	4	1	1	4	1			
	E	ngine oil filter ele-	Replace.	1	V.	1	V	1			

Engine oil strainer

· Clean.

Every 15000 km (9000 mi)



-				ODOMETER READING						
NO.		ITEM	CHECK OR MAINTENANCE JOB	1000 km (600 ml)	5000 km (3000 ml)	10000 km (6000 mi)		20000 km (12000 mi)		
27		Front and rear brake switches	Check operation.	1	1	1	4	4	4	
28		Moving parts and cable ends	Lubricate.	1	1	4	4	4	4	
29		Throttle grip	Check operation. Check throttle grip free play, and adjust if necessary. Lubricate cable end and grip housing.	1	1	4	1	1	-	
30	*	Lights, signals and switches	Check operation. Adjust headlight beam.	1	1	1	4	4	1	

FALIS9350

TIP_

· Air filter

- This model's air intake system is equipped with a disposable oil-coated paper element. The air filter element cannot be cleaned with compressed air, it must be replaced.
- The air filter element needs to be replaced more frequently when riding in unusually wet or dusty areas.
- Hydraulic brake service
 - After disassembling the brake master cylinder and caliper, always change the fluid. Regularly check the brake fluid level and fill the reservoir as required.
 - Every two years replace the internal components of the brake master cylinder and caliper, and change the brake fluid.
 - · Replace the brake hose every four years and if cracked or damaged.



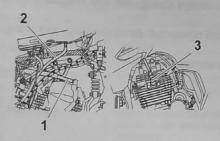
ENGINE

ADJUSTING THE VALVE CLEARANCE

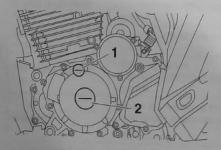
The following procedure applies to all of the valves.

TIP

- Valve clearance adjustment should be made on a cold engine, at room temperature.
- When the valve clearance is to be measured or adjusted, the piston must be at top dead center (TDC) on the compression stroke.
- 1. Remove:
 - Fuel tank right side and left side panels Refer to "FUEL TANK" on page 6-1.
- 2. Disconnect:
 - Cylinder head breather hose "1"
 - Canister hose from fuel tank "2".
 - Spark plug cap "3"



- 3. Remove:
 - Cylinder head valve covers along with "O" rings
 Refer to "CYLINDER HEAD" on page 5-6.
- 4. Remove:
 - Timing mark accessing screw "1"
 - Crankshaft end accessing screw "2"





Center plug spanner YSST-625

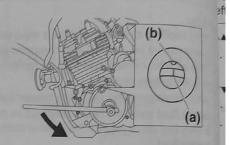
5. Measure:

Valve clearance
 Out of specification → Adjust.



Valve clearance (cold) Intake 0.05-0.10 mm Exhaust 0.08-0.13 mm

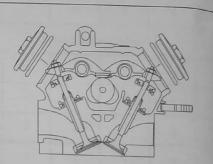
- a. Turn the crankshaft counterclockwise
- b. Align the "I" mark "a" on the AC Magn IP action with the stationary pointer "b" on ad AC Magneto cover.



c. Check that the cam lobes are positioned shown in the illustration.

TIP

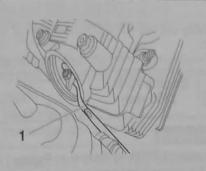
At this position, both the valves must ha some valve clearance.



d. Measure the valve clearance with a feel gauge "1".
 Out of specification → Adjust.



Feeler gauge YSST-1215



TIP

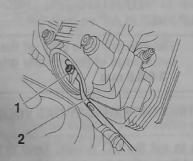
Adjust inlet valve clearance from right side of the vehicle and exhaust valve clearance from left side of the vehicle.

6. Adjust:

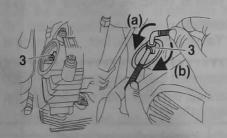
Valve clearance

a. Loosen the locknut "1".

b. Insert a feeler gauge "2" between the end of the adjusting screw and the valve tip.



c. Turn the adjusting screw "3" in direction "a" or "b" until the specified valve clearance is obtained.



Direction "a"
Valve clearance is increased.
Direction "b"
Valve clearance is decreased.



Tappet screw holder YSST-706 (90890-04154) Tappet adjusting socket YSST-806A

 Hold the adjusting screw to prevent it from moving and tighten the locknut to specification



Locknut 14 N·m (1.4 kgf·m, 10 lb·ft)

e. Measure the valve clearance again.

f. If the valve clearance is still out of specification, repeat all of the valve clearance adjustment steps until the specified clearance is obtained.

7. Install:

 Crankshaft end accessing screw (along with the O-ring New)

 Timing mark accessing screw (along with the O-ring New)

8. Install:

- Cylinder head valve cover along with cover
- · Fuel tank breather hose
- Canister hose
- · Spark plug cap
- Fuel tank both side covers
 Refer to "CYLINDER HEAD" on page 5-6.

9. Install:

 Fuel tank right side and left side panels Refer to "FUEL TANK" on page 6-1.

ENGINE

ADJUSTING THE ENGINE IDLING SPEED

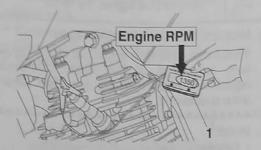
TIP

Prior to adjusting the engine idling speed, the air filter element should be clean, spark plug gap properly adjust and the engine should have adequate compression.

- 1. Start the engine and let it warm up for several minutes.
- 2. Install:
 - Digital tachometer "1" (onto the spark plug lead)



Digital tachometer INS-011



- 3. Check:
 - · Engine idling speed Out of specification → Adjust.



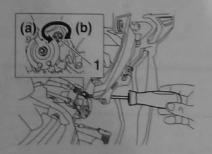
Engine idling speed 1300-1500 r/min

Headlight should be ON before adjusting engine RPM.

a. Turn the RPM adjusting screw "1" in direction "a" or "b" until the specified engine idling speed is obtained.

Direction "a" Engine idling speed is increased. Direction "b"

Engine idling speed is decreased.



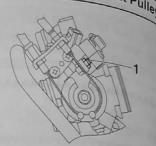
TIP
Preferably set the RPM on lower side of a



Engine RPM 1300 rpm

WARNING

Never adjust RPM by Screw at Pulley



- 4. After adjusting the RPM to specifical
- 5. Adjust:
 - · Throttle grip free play Refer to "ADJUSTING THE THROT GRIP FREE PLAY" on page 3-7.



Throttle grip free play (at the inner edge of the throttle grip

ADJUSTING THE EXHAUST GAS VOLUM

Be sure to set the CO density level to sla dard, and then adjust the exhaust gas volun

- 1. Turn the main switch to "OFF"
- 2. Remove:
 - · Passenger and rider seat
 - · Right side cover Refer to "GENERAL CHASSIS" on page 4
- 3. Connect:
 - · Yamaha diagnostic tool
- a. Disconnect the diagnostic tool connector
- b. Connect the diagnostic connector to the diagnostic tool.



Yamaha diagnostic tool **INS-018** (90890-03256) INS-019 (90890-03254)

- Check or adjust the CO volume.
 Refer to the Yamaha diagnostic tool operation manual.
- Disconnect the Yamaha diagnostic tool, and then connect the diagnostic connector.
- 6. Install:
 - · Right side cover
 - · Passenger and rider seat

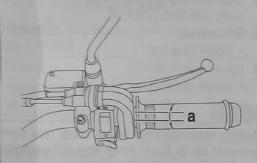
ADJUSTING THE THROTTLE GRIP FREE PLAY

TIP

Prior to adjusting the throttle cable free play, the engine idling speed should be adjusted.

1. Check:

Throttle grip free play "a"
 Out of specification → Adjust.





Throttle grip free play (at the inner edge of the throttle grip) 3.0–5.0 mm

- 2 Adjust
 - Throttle grip free play (at the end of the throttle grip)

Throttle body side

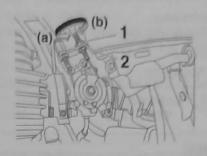
- a. Loosen the locknut "1" on the throttle cable.
- b. Turn the adjusting nut "2" in direction "a" or "b" until the specified throttle cable free play is obtained.

Direction "a"

Throttle grip free play is increased. Direction "b"

Throttle grip free play is decreased.

c. Tighten the locknut.



TIP

- If the specified throttle grip free play cannot be obtained on the throttle body side of the cable, use the adjusting nut on the handlebar side.
- . Keep the handlebar in straight position.

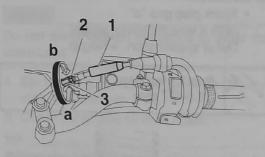
Handlebar side

- a. Slide back the rubber cover "1" at the throttle cable.
- b. Loosen the locknut "2".
- c. Turn the adjusting nut "3" in direction "a" or "b" until the specified throttle grip free play is obtained.

Direction "a"

Throttle grip free play is increased. Direction "b"

Throttle grip free play is decreased.



- d. Tighten the locknut.
- e. Slide the rubber cover to its original position.

WARNING

After adjusting the throttle grip free play, start the engine and turn the handlebar to the right or left to ensure that this does not cause the engine idling speed to change.

CHECKING THE SPARK PLUG

- 1. Disconnect:
 - · Spark plug cap
- 2. Remove:
 - · Spark plug



Spark plug socket YSST-1206

Before removing the spark plug, blow away any dirt accumulated in the spark plug well with compressed air to prevent it from falling into the cylinder.

- 3. Check:
 - Spark plug type Incorrect → Change.

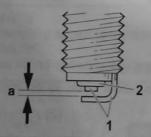


Manufacturer/Model NGK/DR8EA

- 4. Check:
 - Electrode "1" Damage/wear → Replace the spark plug.
 - Insulator "2" Abnormal color → Replace the spark plug. Normal color is medium-to-light tan
- 5. Clean:
 - · Spark plug (with a spark plug cleaner or wire brush)
- 6. Measure:
 - · Spark plug gap "a" (with a wire thickness gauge) Out of specification → Regap.



Spark plug gap 0.6-0.7 mm



- 7. Install:
 - · Spark plug



Spark plug 18 N·m (1.8 kgf·m, 13 lb·ft)

TIP

Before installing the spark plug, clean spark plug and gasket surface.

- 8. Connect:
 - · Spark plug cap

MEASURING THE COMPRESSION PRESSURE

TIP.

Insufficient compression pressure will rea a loss of performance.

- 1. Measure:
 - Valve clearance Out of specification \rightarrow Adjust. Refer to "ADJUSTING THE VA CLEARANCE" on page 3-4.
- 2. Start the engine, warm it up for several, utes, and then turn it off.
- 3. Disconnect:
 - · Spark plug cap
- 4. Remove:
 - · Spark plug

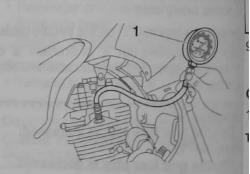
NOTICE

Before removing the spark plug, use pressed air to blow away any dirt accum lated in the spark plug wells to preven from falling into the cylinder.

- 5. Install:
 - Compression gauge "1"



Compression gauge INS-009 (90890-03081)



- 6. Measure:
 - · Compression pressure Out of specification → Refer to steps and (d).





Compression pressure 1200 kPa (at sea level) Minimum-maximum 1044-1344 kPa/300 r/min

- Set the main switch to "ON".
- With the throttle wide open, crank the engine until the reading on the compression gauge stabilizes.
- If the compression pressure is above the maximum specification, check the cylinder head, valve surfaces and piston crown for carbon deposits.

Carbon deposits → Eliminate.

. If the compression pressure is below the minimum specification, pour a teaspoonful of engine oil into the spark plug bore and measure again.

Refer to the following table.

Compression pressure (with oil applied into the cylinder)

tile Cyllinder)		
Reading	Diagnosis	
Higher than without oil	Piston ring(s) wear or damage → Replace.	
Same as without oil	Piston, valves, cylinder head gasket or piston possibly defective → Repair/ Replace.	

- 7. Remove:
 - · Compression gauge

8.Install:

· Spark plug



Spark plug 18 N·m (1.8 kgf·m, 13 lb·ft)

- O. Connect:
 - · Spark plug cap

CHECKING THE ENGINE OIL LEVEL

Stand the vehicle on a level surface.

TIP

- · Place the vehicle on the centerstand.
- · Make sure the vehicle is upright.
- Start the engine, warm it up for several minutes, and then turn it off.

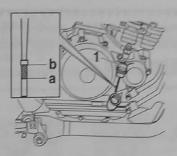
- 3. Check:
 - · Engine oil level

The engine oil level should be between the minimum level mark "a" and maximum level mark "b".

Below the minimum level mark → Add the recommended engine oil to the proper level

TIP

- Before checking the engine oil level, wait a few minutes until the oil has settled.
- Do not screw the dipstick "1" in when checking the oil level.





Recommended brand YAMALUBE Type SAE10W40 Recommended engine oil grade API service SL type, JASO standard MA

NOTICE

Do not allow foreign materials to enter the crankcase.

- 4. Start the engine, warm it up for several minutes, and then turn it off.
- 5. Check the engine oil level again.

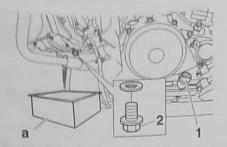
TIP_

Before checking the engine oil level, wait a few minutes until the oil has settled.

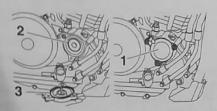
CHANGING THE ENGINE OIL

- 1. Start the engine, warm it up for several minutes, and then turn it off.
- 2. Place an oil pan "a" under the engine oil drain bolt to collect used oil.
- 3. Remove:
 - · Engine oil filler cap "1"
 - · Engine oil drain bolt "2" with washer





- 4. Drain:
 - Engine oil (completely from the crankcase)
- 5. If the oil filter element is also to be replaced, perform the following procedure.
- a. Remove the oil filter element cover "1" along with "O" ring and oil filter element "2"
- b. Install new O-ring "3".



c. Install the new oil filter element and the oil filter element cover along with "O" Ring.



Oil filter element cover bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

Make sure that the O-ring is properly seated.

- 7. Install:
 - · Engine oil drain bolt along with washer



Engine oil drain plug 20 N·m (2.0 kgf·m, 15 lb·ft)

- 8. Fill:
 - Crankcase (with the specified amount of the recommended engine oil)

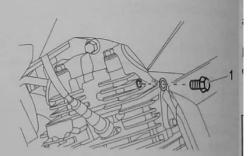


Engine Oil Amount/ Quantity 1.35 L With oil filter element Replacement 1.45 L Total amount of Engine Oil



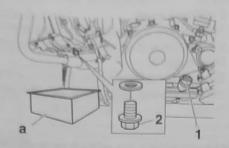
Funnel with long tail S1119

- 9. Install:
 - · Engine oil filler cap
- 10.Start the engine, warm it up for several and then turn it off.
- 11.Check:
 - Engine (for engine oil leaks)
- 12.Check:
 - Engine oil level Refer to "CHECKING THE ENGINE LEVEL" on page 3-9.
- 13.Check:
 - · Engine oil pressure
- a. Slightly loosen the oil check bolt "1"

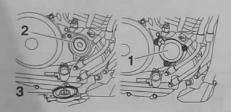


- b. Start the engine and keep it idling u engine oil starts to seep from the oil che bolt. If no engine oil comes out after or minute, turn the engine off so that it will seize.
- c. Check the engine oil passages, the oil fit element and the oil pump for damage

Refer to "OIL PUMP" on page 5-46.



- 4. Drain:
 - Engine oil (completely from the crankcase)
- If the oil filter element is also to be replaced, perform the following procedure.
- a. Remove the oil filter element cover "1" along with "O" ring and oil filter element "2"
- b. Install new O-ring "3".



c. Install the new oil filter element and the oil filter element cover along with "O" Ring.



Oil filter element cover bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

Make sure that the O-ring is properly seated.

- 7. Install:
 - Engine oil drain bolt along with washer



Engine oil drain plug 20 N·m (2.0 kgf·m, 15 lb·ft)

- 8. Fill:
 - Crankcase
 (with the specified amount of the recommended engine oil)



Engine Oil Amount/ Quantity
Periodic oil change
1.35 L
With oil filter element
Replacement
1.45 L
Total amount of Engine Oil

TIP

Fill crankcase with recommended engine oil using funnel with long tail.



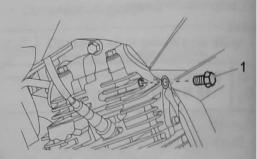
Funnel with long tail S1119

- 9. Install:
 - · Engine oil filler cap

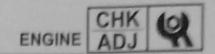
1.55 L

- 10.Start the engine, warm it up for several mutes, and then turn it off.
- 11.Check:
 - Engine (for engine oil leaks)
- 12.Check:
 - Engine oil level
 Refer to "CHECKING THE ENGINE (
 LEVEL" on page 3-9.
- 13.Check:
 - · Engine oil pressure

a. Slightly loosen the oil check bolt "1".



- b. Start the engine and keep it idling un engine oil starts to seep from the oil che bolt. If no engine oil comes out after or minute, turn the engine off so that it will n seize.
- c. Check the engine oil passages, the oil fill element and the oil pump for damage leakage.
 Refer to "OIL PUMP" on page 5-46.



- d. Start the engine after solving the problem(s) and check the engine oil pressure again.
- e. Tighten the oil check bolt to specification.



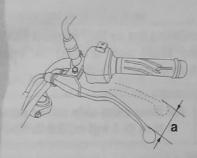
Oil check bolt 7 N·m (0.7 kgf·m, 5.2 lb·ft)

ADJUSTING THE CLUTCH LEVER FREE PLAY

- 1. Check:
 - Clutch lever free play "a"
 Out of specification → Adjust.



Clutch lever free play 10.0-15.0 mm

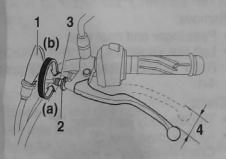


- 2. Adjust:
 - · Clutch lever free play

Handlebar side

- a. Slide back the rubber cover "1" at the clutch lever.
- b. Loosen the locknut "2".
- c. Turn the adjusting bolt "3" in direction "a" or "b" until the specified clutch lever free play "4" is obtained.

Direction "a"
Clutch lever free play is increased.
Direction "b"
Clutch lever free play is decreased.



- d Tighten the locknut.
- e. Slide the rubber cover in its original position.

TIP

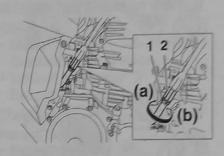
If the specified clutch lever free play cannot be obtained on the handlebar side of the cable, use the adjusting nut on the engine side.

- a. Loosen the locknut "1".
- Turn the adjusting nut "2" in direction "a" or "b" until the specified clutch lever free play is obtained.

Direction "a"
Clutch lever free play is increased.
Direction "b"
Clutch lever free play is decreased.

TIP_

Keep handle straight.



c. Tighten the locknut at the crankcase.



Locknut 10 N·m (1.0 kgf·m, 7.4 lb·ft)

REPLACING THE AIR FILTER ELEMENT AND CLEANING THE CHECK HOSE

TIP

There is a check hose "1" at the bottom of the air filter case. If dust and/or water collects in this hose, clean the air filter element and air filter case.

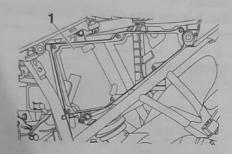


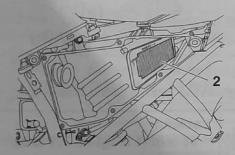
1. Remove:

- · Passenger and rider seat
- Left side cover Refer to "GENERAL CHASSIS" on page 4-1.

2. Remove:

- · Air filter case cover "1"
- Air filter element "2"





3. Check:

 Air filter element Damage → Replace.

NOTICE

- The air filter element must be replaced at the intervals specified in the periodic maintenance and lubrication chart.
- The air filter element needs more frequent replacement if you are riding in unusually wet or dusty areas.
- Do not clean the air filter element by blowing it with compressed air.

TIP

On the bottom of the air filter case is a che hose. If dust or water is found in this hose change the air filter element and clean the filter case.

4. Install:

- · Air filter element "1"
- Air filter case cover (along with a gaskets)



TIP

When installing the air filter element into the filter case. Make sure to insert "→" mark a "↑" mark as shown in illustration.



Air filter case side cover screw 4 N·m (0.4 kgf·m, 3.0 lb·ft)

NOTICE

Never operate the engine without the airle ter element installed. Unfiltered air wears are cause rapid wear of engine parts and η_i damage the engine.

TIP

Make sure the air filter element is proper installed in the air filter case.

7. Install:

- · Left side cover
- Rider and passenger seat
 Refer to "GENERAL CHASSIS" on page 4.1

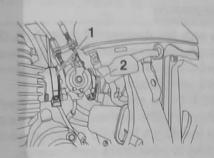
CHECKING THE THROTTLE BODY JOINT AND AIR FILTER CASE JOINT

1. Remove:

- · Passenger and rider seat
- Left side cover Refer to "GENERAL CHASSIS" on page 4-1

2. Check:

- Throttle body joint clamp "1"
- Air filter case joint "2"
 Cracks/damage → Replace.

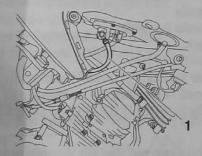


3. Install:

- · Left side cover
- Rider and passenger seat Refer to "GENERAL CHASSIS" on page 4-1.

CHECKING THE FUEL LINE

- 1. Remove:
 - · Passenger and rider seat
 - Right side cover
 Refer to "GENERAL CHASSIS" on page 4-1.
 - Fuel tank right side panel
 Refer to "FUEL TANK" on page 6-1.
- 2. Check:
 - Fuel hose "1"
 Cracks/damage → Replace.
 Loose connection → Connect properly.



3. Install:

- Fuel tank right side panel
 Refer to "FUEL TANK" on page 6-1.
- · Right side cover
- Rider and passenger seat Refer to "GENERAL CHASSIS" on page 4-1.

CHECKING THE CYLINDER HEAD BREATHER HOSE

- 1. Remove:
 - · Passenger and ride seat
 - Left side cover Refer to "GENERAL CHASSIS" on page 4-1.

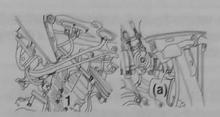
2. Check:

Cylinder head breather hose "1"
 Cracks/damage → Replace.

 Loose connection → Connect properly.

NOTICE

Make sure the cylinder head breather hose "a" is routed properly.



3. Install:

- · Left side cover
- Rider and passenger seat Refer to "GENERAL CHASSIS" on page 4-1.

CHECKING THE EXHAUST SYSTEM

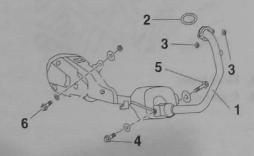
- 1. Check:
 - Muffler "1"
 Cracks/damage → Replace.
 - Exhaust pipe gasket "2"
 Exhaust gas leaks → Replace.
- 2. Check:

Tightening torque

- · Exhaust pipe nuts "3"
- · Muffler bolt (right side) "4"
- · Muffler bolt (left side) "5"
- · Muffler bolt "6"



Exhaust pipe nut
15 N·m (1.5 kgf·m, 11 lb·ft)
Muffler installing bolt
20 N·m (2.0 kgf·m, 15 lb·ft)
Muffler installing bolt (right/ left side bottom)
20 N·m (2.0 kgf·m, 15 lb·ft)



CHASSIS

CHECKING THE BRAKE OPERATION

- 1. Check:
- Brake operation Brake not working properly → Check the brake system.

Refer to "FRONT BRAKE" on page 4-17 and "REAR BRAKE" on page 4-30.

Drive on the dry road, operate the front and rear brakes separately and check to see if the brakes are operating properly.

CHECKING THE BRAKE FLUID LEVEL

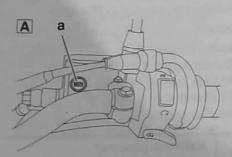
Stand the vehicle on a level surface.

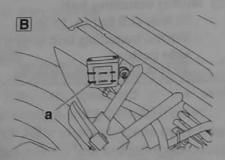
TIP

- · Place the vehicle on a suitable stand.
- · Make sure the vehicle is upright.
- 2. Check:
 - · Brake fluid level Below the minimum level mark "a" → Add the specified brake fluid to the proper level.



Specified brake fluid DOT 4





- A. Front brake
- B. Rear brake

WARNING

- · Use only the designated brake fluid. Oth brake fluids may cause the rubber seals deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid the is already in the system. Mixing brake flui may result in a harmful chemical reaction leading to poor brake performance.
- When refilling, be careful that water don not enter the brake fluid reservoir. Water will significantly lower the boiling point the brake fluid and could cause vapor lo

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NOTICE

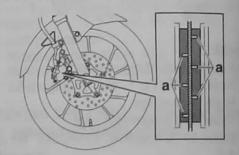
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean any spilt brake fluid immediately.

In order to ensure a correct reading of the bra fluid level, make sure the top of the brake fluid reservoir is horizontal.

CHECKING THE FRONT BRAKE PADS

The following procedure applies to all of the brake pads.

- Operate the brake.
- 2. Check:
- Front brake pad Wear indicator grooves "a" almost disappeared → Replace the brake pads as a se Refer to "FRONT BRAKE" on page 4-24

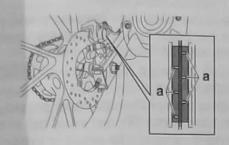


CHECKING THE REAR BRAKE PADS

The following procedure applies to all of the brake pads.

- Operate the brake.
- 2. Check:
 - · Rear brake pad Wear indicator grooves "a" almost disappeared → Replace the brake pads as a se

Refer to "REAR BRAKE" on page 4-35.



CHECKING THE FRONT BRAKE HOSE

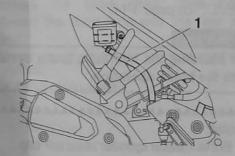
- 1. Check:
- · Brake hose "1" Cracks/damage → Replace.



- 2. Check:
- · Brake hose holder Loose → Tighten the holder bolt.
- · Brake hose guide Loose → Tighten the guide bolt.
- 3. Hold the vehicle upright and apply the brake several times.
- 4. Check:
 - Brake hose Brake fluid leakage → Replace the damaged Refer to "FRONT BRAKE" on page 4-17.

CHECKING THE REAR BRAKE HOSE

- 1. Check:
- · Brake hose "1" Cracks/damage → Replace.



- 2. Check:
- · Brake hose guide Loose → Tighten the bolt.
- 3. Hold the vehicle upright and apply the rear brake several times.
- 4. Check:
 - · Brake hose Brake fluid leakage → Replace the damaged

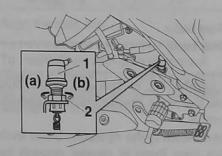
Refer to "REAR BRAKE" on page 4-40.

ADJUSTING THE REAR BRAKE LIGHT **SWITCH**

The rear brake light switch is operated by movement of the brake pedal. The rear brake light switch is properly adjusted when the brake light comes on just before the braking effect starts.

- 1. Check:
 - · Rear brake light operation timing Incorrect → Adjust.
- 2. Adjust:
 - Rear brake light operation timing
- a. Hold the main body "1" of the rear brake light switch so that it does not rotate and turn the adjusting nut "2" in direction "a" or "b" until the rear brake light comes on at the proper time.

Direction "a" Brake light comes on sooner. Direction "b" Brake light comes on later.

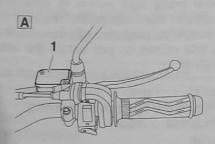


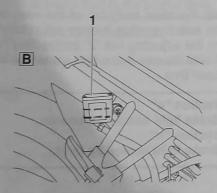
BLEEDING THE HYDRAULIC BRAKE SYSTEM

A WARNING

Bleed the hydraulic brake system whenever:

- The system is disassembled.
- A brake hose is loosened, disconnected or replaced.
- · The brake fluid level is very low.
- · Brake operation is faulty.
- 1. Remove:
 - Brake master cylinder reservoir cap "1"



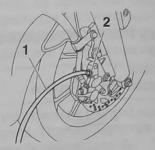


- A. Front brake
- B. Rear brake

TIP

- Be careful not to spill any brake fluid or allow the brake master cylinder reservoir to overflow.
- When bleeding the hydraulic brake system, make sure there is always enough brake fluid before applying the brake. Ignoring this precaution could allow air to enter the hydraulic brake system, considerably lengthening the bleeding procedure.
- If bleeding is difficult, it may be necessary to let the brake fluid settle for a few hours.
 Repeat the bleeding procedure when the tiny bubbles in the hose have disappeared.

- 2. Bleed:
 - Hydraulic brake system
- a. Fill the brake fluid reservoir to the prolevel with the recommended brake fluid
- b. Install the brake master cylinder resent diaphragm.
- c. Connect a clear plastic hose "1" tightly the bleed screw "2"



- d. Place the other end of the hose into a q tainer.
- e. Slowly apply the brake lever several time
- f. Fully pull the brake lever without releas2
- g. Loosen the bleed screw.

TIP

Loosening the bleed screw will release pressure and cause the brake lever to contithe throttle grip.

- h. Tighten the bleed screw and then releathe brake lever.
- Repeat steps (e) to (h) until all of the bubbles have disappeared from the bra fluid in the plastic hose.
- j. Tighten the bleed screw to specification.



Bleed screw 14 N·m (1.4 kgf·m, 10 lb·ft)

k. Fill the brake fluid reservoir to the properties level with the recommended brake fluid. Refer to "CHECKING THE BRAKE FLU LEVEL" on page 3-14.

M WARNING

After bleeding the hydraulic brake syste check the brake operation.

- 3. Install:
 - Brake master cylinder reservoir cap

ADJUSTING THE DRIVE CHAIN SLACK

TIP

The drive chain slack must be checked at the tightest point on the chain.

NOTICE

A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

1. Stand the vehicle on a level surface.

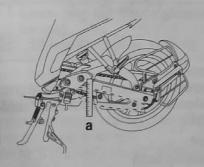
WARNING

Securely support the vehicle so that there is no danger of it falling over.

TIP

Place the vehicle on the centerstand so that the rear wheel is elevated.

- 2. Spin the rear wheel several times and find the tightest position of drive chain.
- 3. Check:
 - Drive chain slack "a"
 Out of specification → Adjust.





Drive chain slack 40-45 mm

TIP

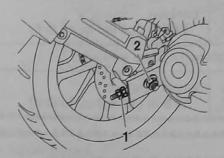
Measure the drive chain slack halfway between the drive axle and the rear wheel axle.

- 4. Adjust:
 - · Drive chain slack

a. Loosen the drive chain puller locknut "1" at

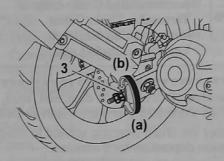
each end of the swingarm.

b. Loosen the wheel axle nut "2".



c. Turn the drive chain slack adjusting nut "3" to adjust the chain slackness on each side of the swingarm.

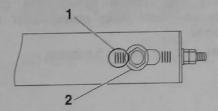
Direction "a"
Drive chain is tightened.
Direction "b"
Drive chain is loosened.

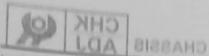


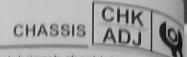
TIP

To maintain the proper wheel alignment, adjust both sides evenly.

- 5. Align the rear axle.
- a. To maintain correct axle alignment.
 Reference lines "1" on the swingarm should be matched with an outer diameter of the washer "2" at both the sides.







b. After adjusting, be, sure, to lighten each to seem, adjusting locknut. Then tighten the axle nut to the specified torque, box roses

c. Tighten both the locknuts only only nasco. I d



Locknut 14 N·m (1.4 kgf·m, 10 lb·ft)

d. Tighten the wheel axle nut,



Wheel axle nut 59 N·m (5.9 kgf·m, 44 lb·ft)

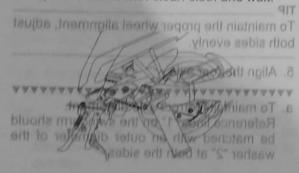
LUBRICATING THE DRIVE CHAIN

The drive chain consists of many interacting parts. If the drive chain is not maintained properly, it will wear out quickly. Therefore, the drive chain should be serviced, especially when the vehicle is used in dusty areas. In O Use recommended chain cleaner and lubricant that is suitable for O-ring chains and evid



Recommended Chain cleaner Yamalube Chain Clean Recommended lubricant Yamalube Chain Lube

- a. Remove all deposits of dust, soil, mud, oil etc during washing and dry it with air blow.
- b. Spray the chain cleaning solvent to remove grease deposition for 5 minutes.
- Wipe the chain with clean cloth and wait.



- d. Spray the Lubricant inside the chain between inner/ outer plates, roller and bushes.
- e. After spraying wait for 5 minutes.

f. Excess lubricant should be wiped with

CHECKING AND ADJUSTING THE OG STEERING HEAD

1. Stand the vehicle on a level surface, the hadrey of the hadrey of the hadrey of the hadrey surface.

warning a lativ sello bas onlyng Securely support the vehicle so that the is no danger of it falling over to magn the drive chain alack within the speak-

Place the vehicle on a center stand so that front wheelds elevated no elaidev and bring

2. Check:

urely support the vehibbed gnihed Ziere Grasp the bottom of the front fork in and gently rock the front fork.

Binding/looseness → Adjust the steen the vehicle on the centerslanded that



- 3. Remove:
 - · Upper bracket Refer to "STEERING HEAD" on pag 4-54.
- 4. Adjust:
 - Steering head

Remove the lock washer "1", the upper in nut "2", and the rubber washer "3"



b. Tighten the lower ring nut "4" with a steering nut socket "5".



TIP

Set the torque wrench at a right angle to the steering nut socket.





Steering nut socket no bengiseb



Lower ring nut (initial tightening torque)
33 N·m (3.3 kgf·m, 24 lb·ft)

 c. Loosen the lower ring nut "4" 1/4 turn out, and then tighten it to specification with a steering nut socket.

can be given if a tire com DNINAW A

Do not overtighten the lower ring nut.

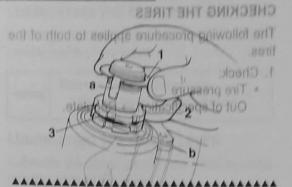


Lower ring nut (final tightening torque)
22 N·m (2.2 kgf·m, 16 lb·ft)

- d. Check the steering head for looseness or binding by turning the front fork all the way in both directions. If any binding is felt, remove the lower bracket and check the upper and lower bearings. Refer to "STEERING HEAD" on page 4-54.
- e. Install the rubber washer "3".
- f. Install the upper ring nut "2". M
- g. Finger tighten the upper ring nut "2", and then align the slots of both ring nuts. If necessary, hold the lower ring nut and tighten the upper ring nut until their slots are aligned.

TIP

Make sure the lock washer tabs "a" sit correctly in the ring nut slots "b"



5. Install:

Upper bracket
 Refer to "STEERING HEAD" on page
4-54.

CHECKING THE FRONT FORK

1. Stand the vehicle on a level surface.

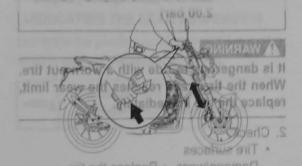
The tire pressure should only be checked and regulated when the tip DRINARW

Securely support the vehicle so that there is no danger of it falling over a suit and a

- 2. Check! the total weight of gribnoss
- Inner tube

 Damage/scratches → Replace.
- Oil seal
 Oil leakage → Replace.
- 3. Hold the vehicle upright and apply the front brake.
- 4. Check:
 - Front fork operation
 Push down hard on the handlebar several times and check if the front fork rebounds smoothly.

 Rough movement → Repair.
 Refer to "FRONT FORK" on page 4-46.



CHECKING THE TIRES

The following procedure applies to both of the tires.

- 1. Check:
 - Tire pressure
 Out of specification → Regulate.



WARNING

- The tire pressure should only be checked and regulated when the tire temperature equals the ambient air temperature.
- The tire pressure must be adjusted according to the total weight (including cargo, rider, passenger and accessories) and the anticipated riding speed.
- Operation of an overloaded vehicle could cause tire damage, an accident or an injury.

NEVER OVERLOAD THE VEHICLE



Tire air pressure (measured on cold tires)

Front

175 kPa (1.75 kgf/cm², 25 psi, 1.75 bar)

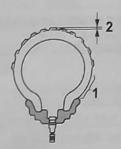
ear

200 kPa (2.00 kgf/cm², 29 psi, 2.00 bar)

WARNING

It is dangerous to ride with a worn-out tire. When the tire tread reaches the wear limit, replace the tire immediately.

- 2. Check:
 - Tire surfaces
 Damage/wear → Replace the tire



- 1. Tire sidewall
- 2. Tire tread depth

WARNING

- Do not use a tube tire on a whether designed only for tubeless tires to avoid tire failure and personal injury from suden deflation.
- After extensive tests, the tires list below have been approved by YAMAN for this model. The front and rear tin should always be by the same manufaturer and of the same design. No guaratee concerning handling characteristic can be given if a tire combination of than one approved by YAMAHA is us on this vehicle.



Front tire Size

> 100/80-17 M/C 52P Manufacturer/model MRF/NYLOGRIP ZAPPER-FX1



Rear tire Size

> 140/70 17M/C 66S Manufacturer/model MRF/NYLOGRIP ZAPPER-S2

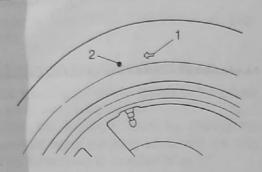
WARNING

New tire have a relatively low grip on the road surface until they have been slight worn. Therefore, approximately 100 ke should be traveled at normal speed befor any high-speed riding is done.

TIP

For tires with a direction of rotation mark "1":

- Install the tire with the mark pointing in the direction of wheel rotation.
- Align the mark "2" with the valve installation point.



CHECKING THE WHEELS

The following procedure applies to both of the wheels.

- 1. Check:
 - Wheel Damage/out-of-round → Replace.

WARNING

Never attempt to make any repairs to the Wheel

TIP_

After a tire or wheel has been changed or replaced, always balance the wheel.

CHECKING AND LUBRICATING THE CABLES END

The operation and condition of all control cables should be checked. And control cables end should be lubricate the intervals specified in the periodic maintenance chart.

WARNING

Damaged outer cable may cause the cable to corrode and interfere with its movement. Replace damaged outer cable and inner cables as soon as possible.

- 1. Check:
 - Outer cable
 Damage → Replace.
- 2. Check:
 - Cable operation
 Rough movement → Lubricate cable end/ replace.

LUBRICATING THE CLUTCH LEVER

Lubricate the pivoting point and metal-to-metal moving parts of the lever.



Recommended lubricant Lithium-soap-based grease

LUBRICATING THE BRAKE LEVER

Lubricate the pivoting point and metal-to-metal moving parts of the lever.



Recommended lubricant Silicone grease

LUBRICATING THE PEDALS

Lubricate the pivoting point and metal-to-metal moving parts of the pedals.



Recommended lubricant Lithium-soap-based grease

LUBRICATING THE SIDESTAND

Lubricate the pivoting point and metal-to-metal moving parts of the sidestand.



Recommended lubricant Lithium-soap-based grease

LUBRICATING THE CENTERSTAND

Lubricate the pivoting point and metal-to-metal moving parts of the centerstand.



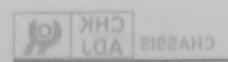
Recommended lubricant Lithium-soap-based grease

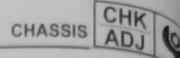
LUBRICATING THE REAR SUSPENSION

Lubricate the pivoting point and metal-to-metal moving parts of the rear suspension.



Recommended lubricant Lithium-soap-based grease





ABSORBER ASSEMBLY

The following procedure applies for the rear shock absorber assembly adjustment.

A WARNING

Securely support the vehicle so that there is no danger of it falling over.

TIP

Place the vehicle on the centerstand so that the rear wheel is elevated.

NOTICE

Never go beyond the maximum or minimum adjustment positions.

- 1. Adjust:
 - · Spring preload
- Turn the adjusting ring "1" in direction "a" or "b".
- b. Align the desired position on the adjusting ring with the stopper "2".

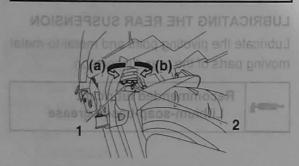
Direction a	Spring preload is increased (suspension is harder).		
Direction b	Spring preload is decreased (suspension is softer).		

Adjusting positions

Minimum (soft): 1

Standard: 3

Maximum (hard): 7





Rear shock absorber adjuster YSST-821

ELECTRICAL SYSTEM

CHECKING AND CHARGING THE BATTERY

Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-62.

CHECKING THE FUSES

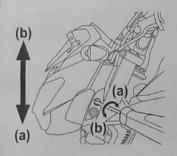
Refer to "CHECKING THE FUSE" on page 7-61.

ADJUSTING THE HEADLIGHT BEAM

The following procedure applies to the adjustment of the headlight beam.

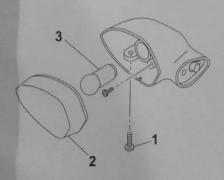
Adjust the headlight beam by rotating the headlight beam adjusting screw with the help of flip screwdriver in direction "a" or "b".

Direction "a"
Headlight beam is lowered.
Direction "b"
Headlight beam is raised.



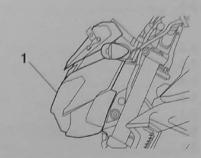
REPLACING TURN SIGNAL LIGHT BULB

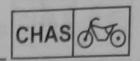
- 1. Remove
 - · Screw "1" from turn signal light
 - · Lens "2" from light
- Push the bulb "3" and rotate counter clockwise.



REPLACING THE AUXILIARY LIGHT BULB

- 1. Remove:
 - Headlight assembly "1" and then replace auxiliary light bulb.
 Refer to "GENERAL CHASSIS" on page 4-2.



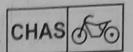


CHAPTER 4 GENERAL CHASSIS

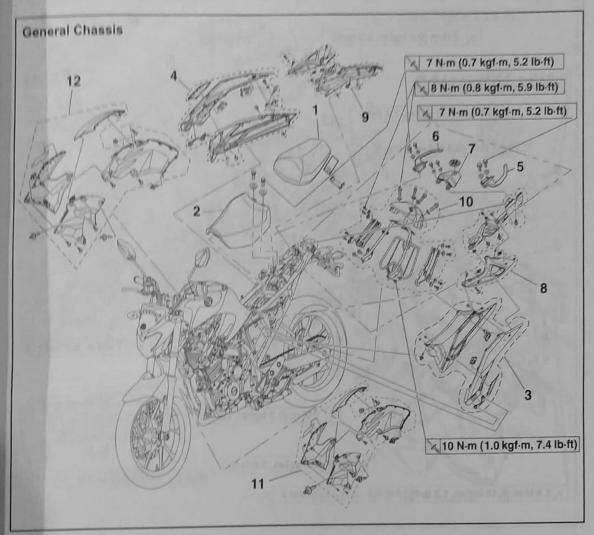
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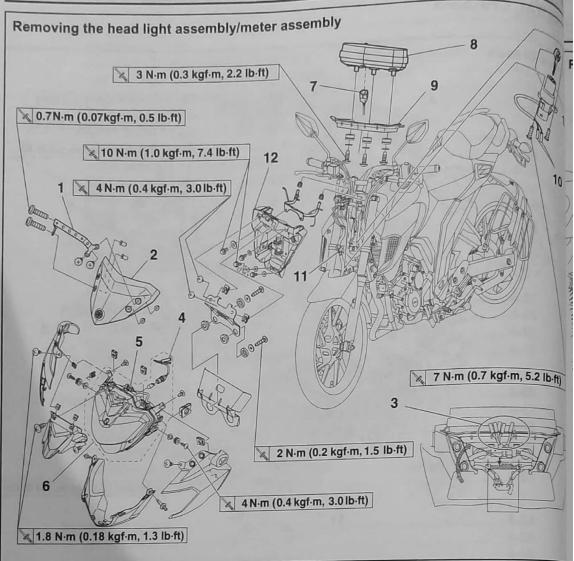
INTRODUCTION CHECKING THE REAR BRAKE DISC REPLACING THE REAR BRAKE PADS REMOVING THE REAR BRAKE CALIPER DISASSEMBLING THE REAR BRAKE CALIPER CHECKING THE REAR BRAKE CALIPER CHECKING THE REAR BRAKE CALIPER BRACKET ASSEMBLING THE REAR BRAKE CALIPER INSTALLING THE REAR BRAKE CALIPER REMOVING THE REAR BRAKE CALIPER CHECKING THE REAR BRAKE MASTER CYLINDER CHECKING THE REAR BRAKE MASTER CYLINDER ASSEMBLING THE REAR BRAKE MASTER CYLINDER INSTALLING THE REAR BRAKE MASTER CYLINDER INSTALLING THE REAR BRAKE MASTER CYLINDER REAR BRAKE HOSE INSTALLATION	4-3
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GENERAL CHASSIS

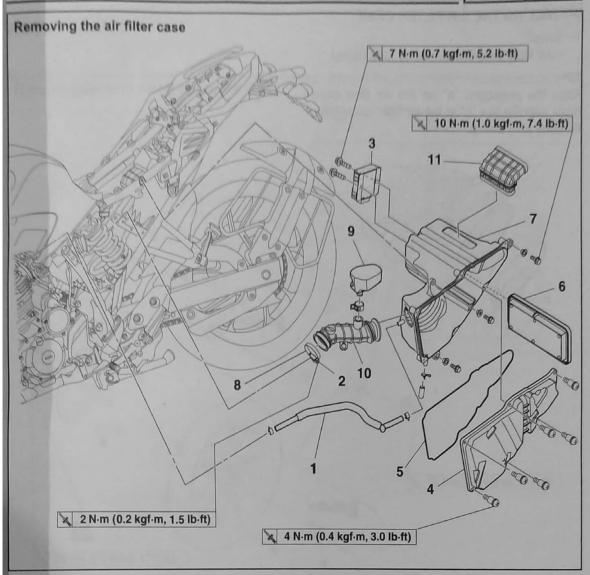


Order	Job/Parts to remove	Q'ty	Remarks
1	Passenger seat	1	The State of the S
2	Rider seat	1	Darwing
3	Left side cover	1	Transfer the land built
4	Right side cover	1	
5	Left seat handle	1	
6	Right seat handle	1	
7	Tail cover	1	
8	Left rear side cover	1	the world
9	Right rear side cover	1	The state of the s
10	Mud protector	1	many transfer and the state of
11	Left side panel assembly	1	The second secon
12	12 Right side panel assembly	1	and the state of t
			For installation, reverse the removal procedure.



Order	Job/Parts to remove	Q'ty	Remarks
1	Licence plate stay	1	
2	Windshield	1	
3	Turn signal light connector (LH/RH)	1	Disconnect.
4	Auxiliary light connector	1	Disconnect.
5	Head light coupler	1	Disconnect.
6	Head light assembly	1	
7	Meter connector	1	Disconnect.
8	Meter assembly	1	
9	Meter pad	1	
10	Ignition switch connector	1	THE RESERVE OF THE PARTY OF THE
11	Front brake hose holder	1	Exactly of fadill
12	Head light stay	1	The Sales Resignated State
13	Main switch steering lock	1	BARRY LANGUAGE CO. LANGUAGE
			For installation, reverse the removal procedure.

^{*} Removing and installing the main switch steering lock screw by using special tool [Main swit_steering lock (T-30) - (YSST-611A)].



Order	Job/Parts to remove	Q'ty	Remarks
	Passenger seat, rider seat, Left side cover, Right side cover, Tail cover, Left rear side cover		Refer to "GENERAL CHASSIS" on page 4-1.
1	Cylinder head breather hose	1	Disconnect.
2	Air filter case/Throttle body joint clamp screw	1	Loosen.
3	Rectifier regulator unit	1	
4	Air filter case cover	1	
5	Air filter seal	1	
6	Air filter element	1	
7	Air filter case	1	
8	Air filter case/Throttle body joint clamp	1	
9	Resonator	1	
10	Air filter hose	1	
11 Duct	Duct	1	
			For installation, reverse the removal procedure.

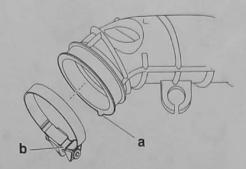
INSTALLING THE AIR FILTER CASE

1. Install:

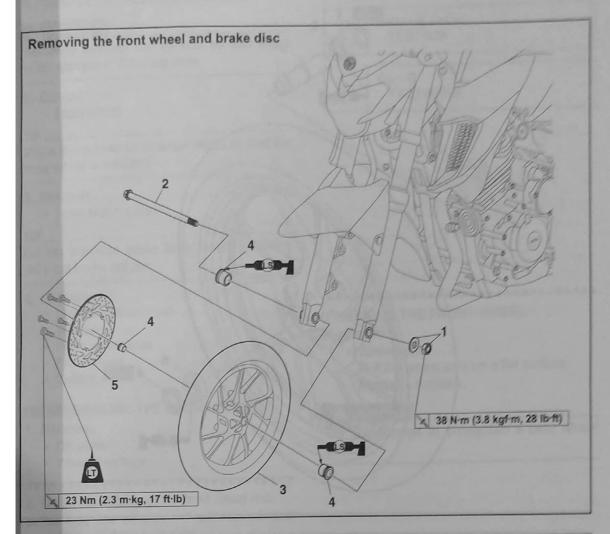
Air filter case/Throttle body joint clamp

TIP_

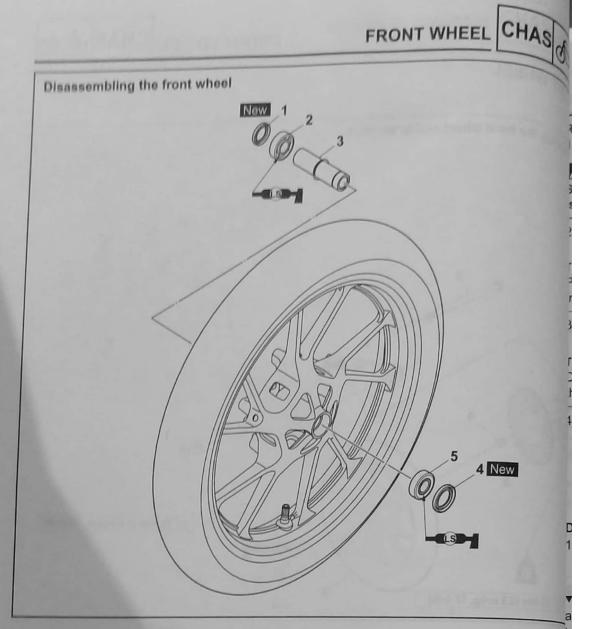
Align the projection "a" on the air filter case hose with the slot "b" in the air filter case/throttle body joint clamp.



FRONT WHEEL



Order	Job/Parts to remove	Q'ty	Remarks
1	Front wheel axle nut/washer	1/1	
2	Front wheel axle	1	
3	Front wheel	1	A STATE OF THE STA
4	Collar	2	
5	Brake disc	1	The second second
4.5			For installation, reverse the removal procedure.



Order	Job/Parts to remove	Q'ty	Remarks
1	Oil seal	1	or transfer day bearing to an in-
2	Bearing	1	
3	Spacer	1	
4	Oil Seal	1	
5	Bearing	1	
	AND THE REAL PROPERTY.		For assembly, reverse the disassembly procedure.

FRONT WHEEL CHAS

REMOVING THE FRONT WHEEL (DISC)

1. Stand the vehicle on a level surface.

A WARNING

Securely support the vehicle so that there is no danger of it falling over.

2. Elevate:

· Front wheel

Place the vehicle on a center stand so that the front wheel is elevated.

3. Remove:

· Front brake caliper

TIP

Do not squeeze brake lever when removing the front brake caliper.

4. Remove:

- · Front wheel axle nut
- Washer
- · Front wheel axle
- Front wheel
- · Collars

DISASSEMBLING THE FRONT WHEEL

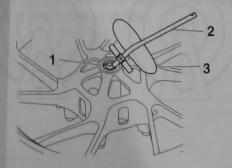
- 1. Remove:
 - · Oil seals
 - · Wheel bearings

- a. Clean the outside of the front wheel hub.
- b. Remove the oil seal "1" with an oil seal remover "2" from both side.

To prevent damaging the wheel, place a rag "3" between the oil seal remover and the wheel surface.



Oil seal remover YSST-270



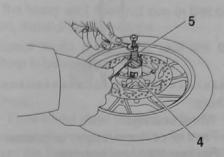
c. Remove the wheel bearing "4" with a bearing puller "5"



Bearing puller YSST-624



Cup-B YSST-620-B

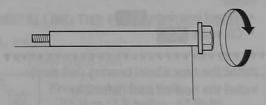


CHECKING THE FRONT WHEEL

- 1. Check:
 - · Wheel axle Roll the wheel axle on a flat surface. Bends → Replace.

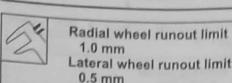
WARNING

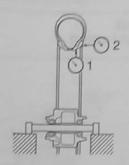
Do not attempt to straighten a bent wheel axle.



2. Check:

- · Tire
- Front wheel Damage/wear → Replace. Refer to "CHECKING THE TIRES" on page 3-20 and "CHECKING THE WHEELS" on page 3-21.
- 3. Measure:
 - · Radial wheel runout "1"
 - · Lateral wheel runout "2" Over the specified limits → Replace.





- 4. Check:
 - Wheel bearings
 Front wheel turns roughly or is loose →
 Replace the wheel bearings.
 - Oil seals
 Damage/wear → Replace.



ASSEMBLING THE FRONT WHEEL

- 1. Install:
 - Wheel bearings New
 - · Oil seals New
- a. Install the new wheel bearing (left side).
- b. Install the new oil seal (left side)

NOTICE

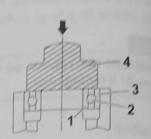
Do not contact the wheel bearing inner race "1" or balls "2". Contact should be made only with the outer race "3".

TIP.

Use bearing punch "4" with an appropriate pilot driver that matches the diameter of the wheel bearing outer race and oil seal.



Bearing punch YSST-951



- c. Install the spacer.
- d. Install the new wheel bearing (right side)
- e. Install the new oil seal (right side).

FRONT WHEEL

ADJUSTING THE FRONT WHEEL STATE

TIP

- After replacing the tire, wheel or both, front wheel static balance should adjusted.
- Adjust the front wheel static balance the brake discs installed.
- 1. Remove:
 - · Balancing weight(s)
- 2. Find:
 - · Front wheel's heavy spot

TIP

Place the front wheel on a suitable balance stand.



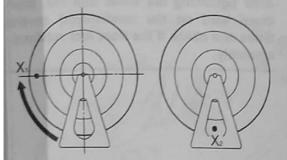
Wheel Balancer YSST-889

- a. Spin the front wheel.
- b. Wheel the front wheel stops, put an " mark at the bottom of the wheel.



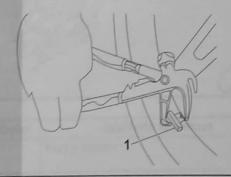


- c. Turn the front wheel 90 so that the "X4" mark is positioned as shown.
- d. Release the front wheel.
- e. When the wheel stops, put an "X2" mark at the bottom of the wheel.



- f. Repeat steps (c) through (e) several times until all the marks come to rest at the same
- g. The spot where all the marks come to rest is the front wheel's heavy spot "X"

- 3. Adjust:
 - · Front wheel static balance
- ******** a. Install a balancing weight "1" onto the rim exactly opposite the heavy spot "X".





Special Plier YSST-888

Start with the lightest weight.

b. Turn the front wheel 90° so that the heavy spot is positioned as shown.



- c. If the heavy spot does not stay in that position, install a heavier weight.
- d. Repeat steps (b) and (c) until the front wheel is balanced.

- 4. Check:
 - · Front wheel static balance

******** a. Turn the front wheel and make sure it stays at each position shown.



b. If the front wheel does not remain stationary at all of the positions, rebalance it.

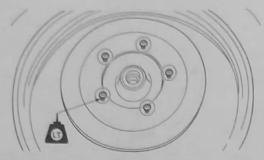
INSTALLING THE FRONT WHEEL (DISC)

- 1. Install:
 - · Front brake disc



Front brake disc bolt 23 N·m (2.3 kgf·m, 17 lb·ft) LOCTITE®

Tighten the brake disc bolts in stages and in a crisscross pattern.



2. Check:

· Front brake disc Refer to "CHECKING THE FRONT BRAKE DISC" on page 4-23.

3. Lubricate:

- · Wheel axle
- · Oil seal lip



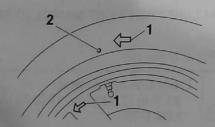
Recommended lubricant Lithium-soap-based grease

4. Install:

- · Collars
- · Front wheel

TIP

- Install the tire and wheel with the mark "1" pointing in the direction of wheel rotation.
- Align the DOT mark "2" with the tire air valve installation point.
- Apply lithium-soap-based grease to the contact surface and threads of the front wheel axle nut.



5. Install:

· Wheel axle



Wheel axle 38 N·m (3.8 kgf·m, 28 lb·ft)

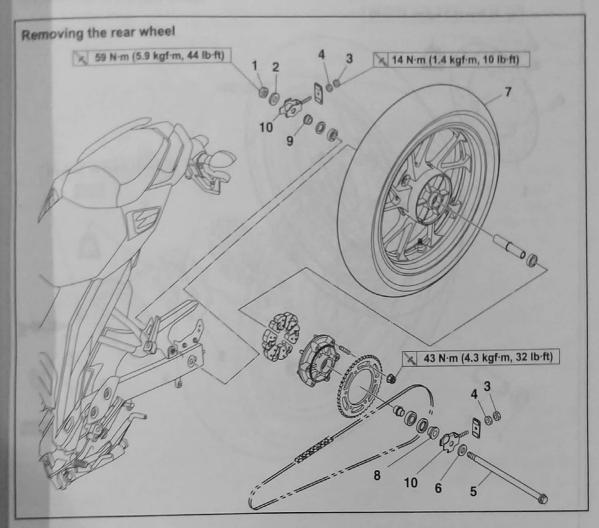
WARNING

Make sure the brake hose is routed erly.

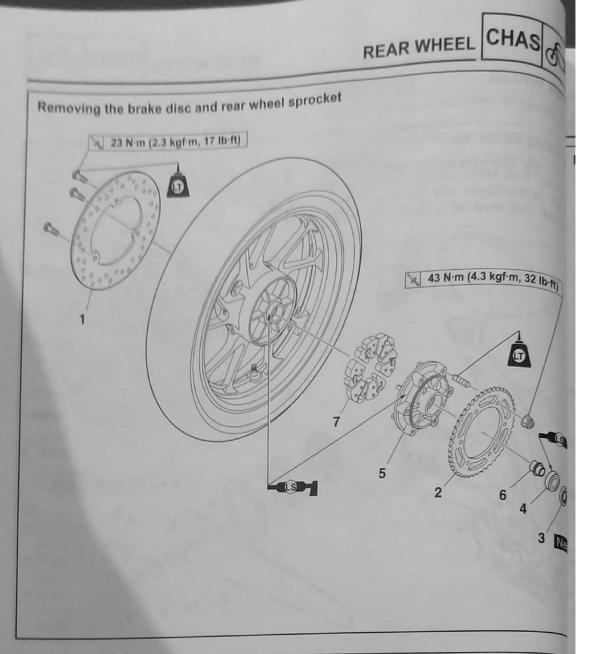
NOTICE

After tightening the wheel axle nut down hard on the handlebar(s) times and check if the front fork reb smoothly.

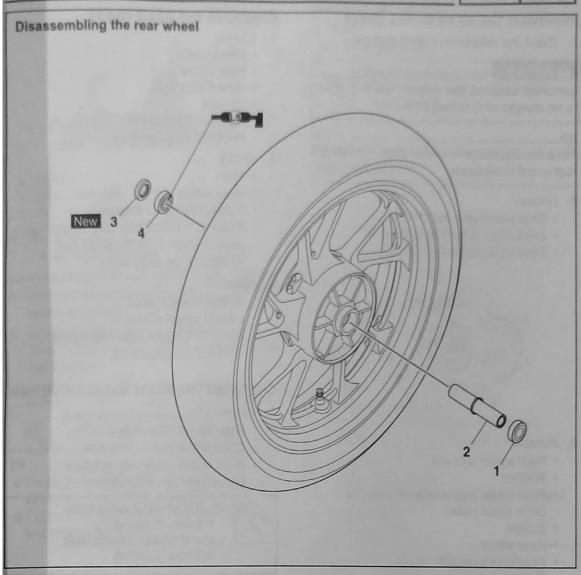
REAR WHEEL



Order	Job/Parts to remove	Q'ty	Remarks
	Mud protector		Refer to "GENERAL CHASSIS" on page 4-1.
1	Axle nut	1	Secretary Secretary Secretary
2	Washer	1	estable &
3	Drive chain adjusting locknut	2	Loosen.
4	Drive chain adjusting nut	2	Loosen.
5	Rear wheel axle	1	To the second class base said and
6	Washer	1	
7	Rear wheel	1	
8	Collar sprocket axle	1	
9	Collar wheel	1	
10	Drive chain puller	2	
			For installation, reverse the removal procedure.



Order	Job/Parts to remove	Q'ty	Remarks
1	Rear brake disc	1	Volunting bullet
2	Rear wheel sprocket	1	
3	Oil seal	1	RPI SUCK
4	Bearing	1	1970071
5	Rear wheel drive hub	1	THE CONTRACTOR OF THE PARTY OF THE PARTY.
6	Collar	1	pri su printer unuo esseri
7 Rear wheel drive hub damper	4	67 BOW 4691	
			For installation, reverse the removal procedure.



Order	Job/Parts to remove	Q'ty	Remarks
1	Wheel bearing	1	THE COME COME THE PARTY OF
2	Spacer	1	The second second
3	Oil seal	1	THE RESIDENCE THE RESIDENCE TO SERVED THE SERV
4	Wheel bearing	1	
	See to the latter to page		For assembly, reverse the disassembly procedure.

REMOVING THE REAR WHEEL (DISC)

1. Stand the vehicle on a level surface.

A WARNING

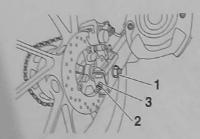
Securely support the vehicle so that there is no danger of it falling over.

TIP

Place the vehicle on a center stand so that the rear wheel is elevated.

2. Loosen:

- · Rear wheel axle nut "1"
- · Drive chain adjusting locknut "2"
- · Drive chain adjusting nut "3"



3. Remove

- · Rear wheel axle nut
- Washer
- · Rear wheel axle along with washer
- · Drive chain puller
- · Collars
- · Rear wheel
- · Rear brake caliper

TIP

- Push the rear wheel forward and remove the drive chain from the rear wheel sprocket.
- Do not press the brake pedal when removing the rear wheel.

DISASSEMBLING THE REAR WHEEL

- 1. Remove:
 - · Oil seal
 - Wheel bearings Refer to "DISASSEMBLING THE REAR WHEEL" on page 4-14.

CHECKING THE REAR WHEEL

- 1. Check:
 - · Wheel axle
 - Rear wheel
 - Wheel bearings
 - Oil seal Refer to "CHECKING THE REAR WHEEL" on page 4-14.

2. Check:

- · Tire
- Rear wheel
 Damage/wear → Replace.

 Refer to "CHECKING THE TIRES" page 3-20 and "CHECKING THE WHEELS" on page 3-21.

3. Measure:

- Radial wheel runout
- Lateral wheel runout Refer to "CHECKING THE REAR WHEEL" on page 4-14.

CHECKING THE REAR WHEEL DRIVE

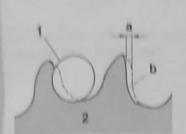
- 1. Check:
 - Rear wheel drive hub Cracks/damage → Replace.
 - Rear wheel drive hub dampers Damage/wear → Replace.



Radial wheel runout limit 1.0 mm (0.04 in) Lateral wheel runout limit 0.5 mm (0.02 in)

CHECKING AND REPLACING THE REAL WHEEL SPROCKET

- 1. Check:
 - Rear wheel sprocket
 More than 1/4 tooth "a" wear → Rep
 the drive chain, drive sprocket, and
 wheel sprocket as a set.
 Bent teeth → Replace the drive chain
 drive sprocket, and rear wheel sproof
 as a set.



- b. Correct
- 1. Drive chain roller
- 2. Rear wheel sprocket
- 2. Replace:
 - · Rear wheel sprocket

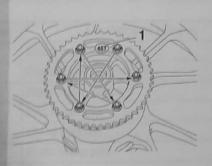
- Remove the self-locking nuts and the rear wheel sprocket.
- b. Clean the rear wheel drive hub with a clean cloth, especially the surfaces that contact the sprocket.
- c. Install the new rear wheel sprocket.



Rear wheel sprocket nut 43 N·m (4.3 kgf·m, 32 lb·ft)

TIP

- Install the rear wheel sprocket with its manufacture's mark "1" facing outward.
- Tighten the self-locking nuts in stages and in a crisscross pattern.



ASSEMBLING THE REAR WHEEL

- 1. Install:
 - Wheel bearings
 Refer to "ASSEMBLING THE FRONT WHEEL" on page 4-8.

INSTALLING THE REAR WHEEL (DISC)

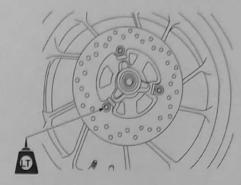
- 1. Install:
 - · Rear brake disc



Rear brake disc bolt 23 N·m (2.3 kgf·m, 17 lb·ft) LOCTITE®

TIP

Tighten the brake disc bolts in stages and in a crisscross pattern.



- 2. Check:
 - Rear brake disc Refer to "CHECKING THE REAR BRAKE DISC" on page 4-35.
- 3. Lubricate:
 - · Rear wheel axle
 - Contact surface of rear wheel hub and rear wheel
 - · Oil seal lips

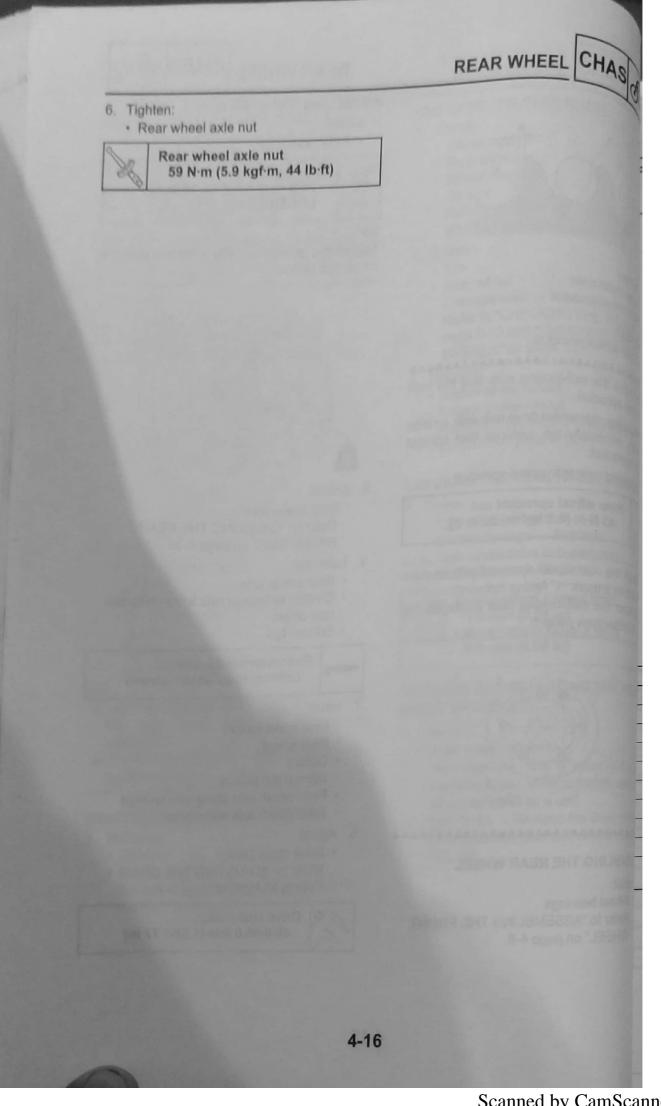


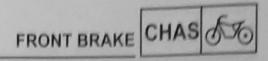
Recommended lubricant Lithium-soap-based grease

- 4. Install:
 - · Rear brake caliper
 - · Rear wheel
 - Collars
 - · Drive chain pullers
 - · Rear wheel axle along with washer
 - · Rear wheel axle nut/washer
- 5. Adjust:
 - Drive chain slack
 Refer to "ADJUSTING THE DRIVE
 CHAIN SLACK" on page 3-18.

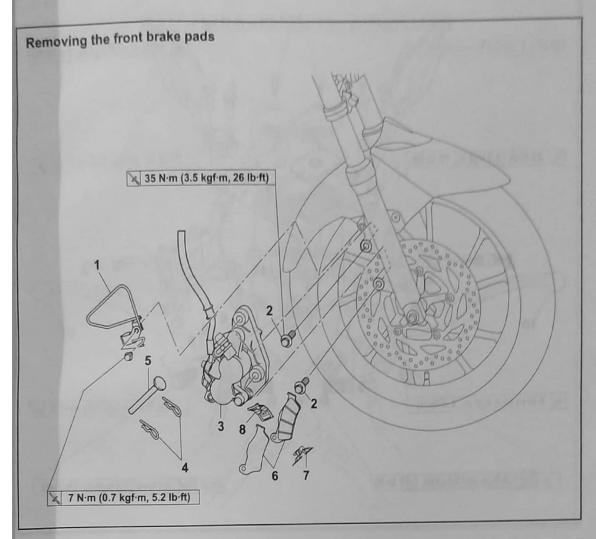


Drive chain slack 40.0-45.0 mm (1.57-1.77 in)

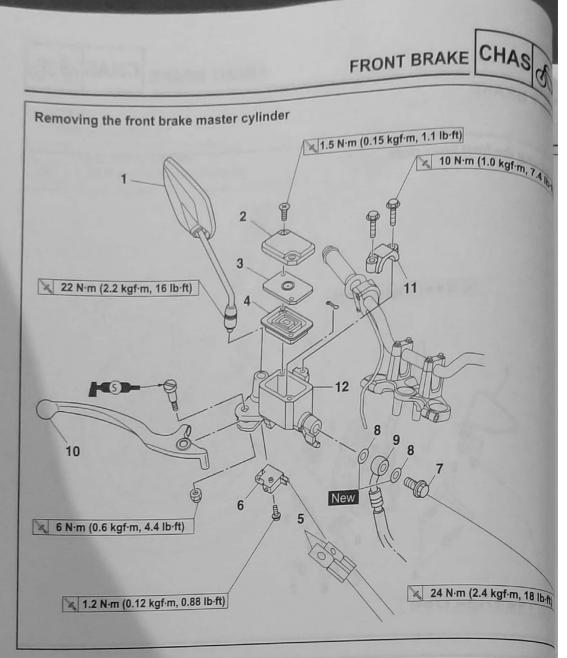




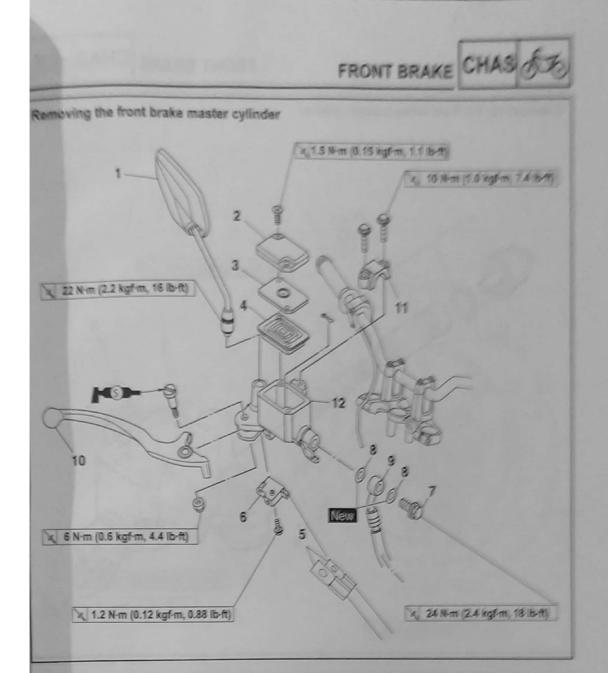
FRONT BRAKE



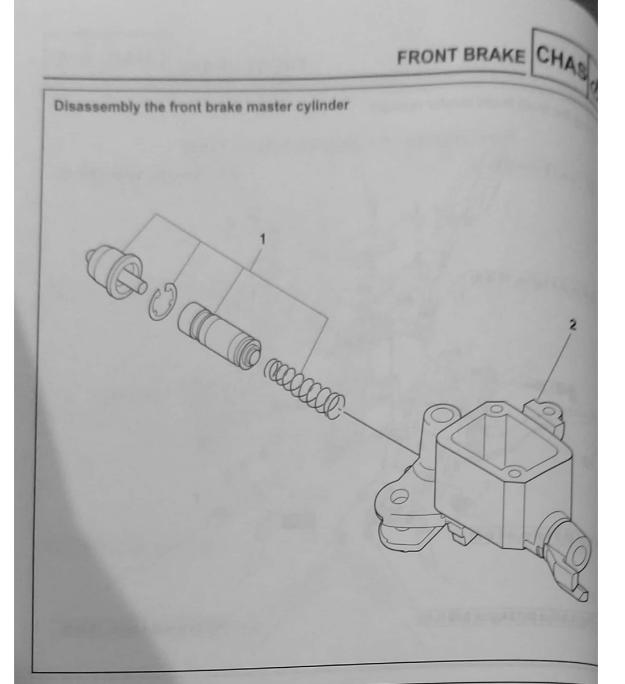
Order	Job/Parts to remove	Q'ty	Remarks
1	Brake hose holder	1	
2	Front brake caliper bolt	2	
3	Front brake caliper	1	
4	Brake pad clip	2	AND STREET STATE OF S
5	Brake pad pin	1	
6	Front brake pad	2	THE RESIDENCE OF THE PROPERTY OF THE PARTY O
7	Brake pad spring	1	
8	Brake pad support (clip)	1	
			For installation, reverse the removal procedure.



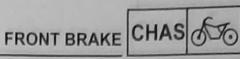
Order	Job/Parts to remove	Q'ty	Remarks
Older	Brake fluid		Drain Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-16.
1	Right rear view mirror	1	tille tier adjul
2	Brake master cylinder reservoir cap	1	ed from water [2]
3	Brake master cylinder reservoir diaphragm holder	1	hap exist here!
4	Brake master cylinder reservoir diaphragm	1	
5	Front brake light switch connector	2	Disconnect.
6	Front brake light switch	1	
7	Brake hose union bolt	1	
8	Copper washer	2	
9	Front brake hose	1	
10	Brake lever	1	

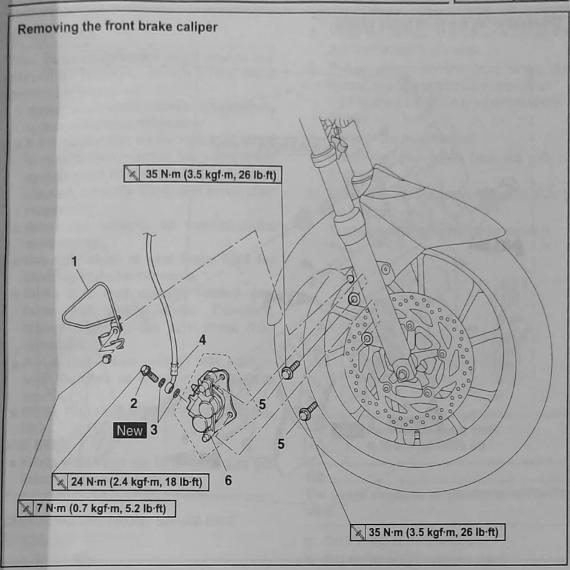


Order	Job/Parts to remove	Q'ty	Remarks
11	Front brake master cylinder holder	1	
12	Front brake master cylinder	1	
			For installation, reverse the remova procedure.

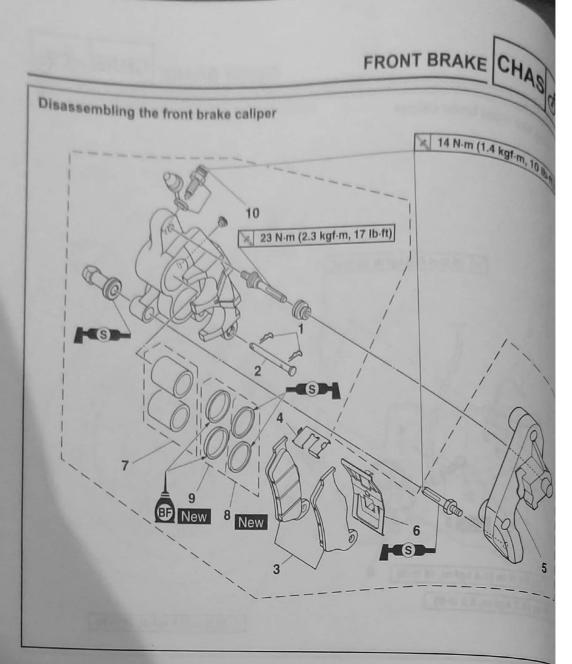


arts to remove	1	
	1	
Master cylinder kit Master cylinder body		For assembly, reverse the disassembly procedure.
	it	it 1

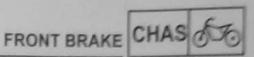




Order	Job/Parts to remove	Q'ty	Remarks
133	Brake fluid	T NO	Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-16.
1	Front brake hose holder	1	The second secon
2	Brake hose union bolt	1	The S of Tide Security in a
3	Copper washer	2	The state of the s
4	Front brake hose	1	and a long of the later
5	Front brake caliper bolt	2	The second secon
6	Front brake caliper	1	the state of the profession and the state of the state of the
		1	For installation, reverse the removal procedure.



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake pad clip	2	The state of the s
2	Brake pad pin	1	
3	Front brake pad	2	
4	Brake pad spring	1	
5	Brake caliper bracket	1	DOMESTIC OF THE PARTY OF THE PA
6	Brake pad support	1	
7	Brake caliper piston	2	
8	Brake caliper piston dust seal	2	
9	Brake caliper piston seal	2	100 pt 10
10	Bleed screw	1	
			For assembly, reverse the disasser procedure.



INTRODUCTION

WARNING

Disc brake components rarely require disassembly. Therefore, always follow these preventive measures:

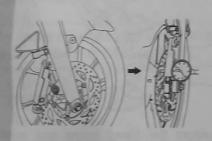
- · Never disassemble brake components unless absolutely necessary.
- . If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bleed after reassembly.
- Never use solvents on internal brake components.
- · Use only clean or new brake fluid for cleaning brake components.
- · Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.
- · Avoid brake fluid coming into contact with the eyes as it can cause serious injury.
- . FIRST AID FOR BRAKE FLUID ENTER-ING

THE EYES:

. Flush with water for 15 minutes and get immediate medical attention.

CHECKING THE FRONT BRAKE DISC

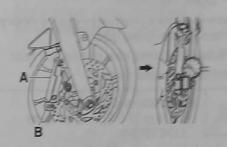
- 1. Check:
 - · Brake disc Damage/galling → Replace.
- 2. Measure:
 - · Brake disc runout Out of specification → Correct the brake disc runout or replace the brake disc.





Brake disc runout limit 0.10 mm (0.0039 in)

- a. Place the vehicle on a center stand so that the front wheel is elevated.
- b. Before measuring the front brake disc runout, turn the handlebar to the left or right to ensure that the front wheel is stationary.
- c. Remove the brake caliper.
- d. Install the disc brake face out tool on mounting A.
- e. Install the dial gauge on the other side of
- f. Tighten dial gauge properly by screw B.





Brake disc runout limit 0.10 mm (0.0039 in)

The gauge should be perpendicular to the disc plate.

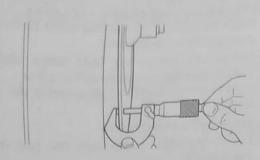
- g. Set the dial at zero position.
- h. Rotate the wheel by hand slowly.
- i. Measure the runout 5 mm below the edge of the brake disc.

Note down the measurement at four different points and compare with given specification.



Disc Brake Face Out YSST - 890

- Measure:
 - · Brake disc thickness Measure the brake disc thickness at a few different locations. Out of specification → Replace.





Brake disc thickness limit 3.5 mm (0.14 in)

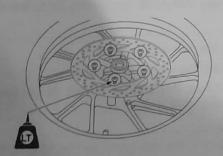
- Adjust:
 - · Brake disc runout
- Remove the brake disc.
- b. Rotate the brake disc by one bolt hole.
- Install the brake disc.



Front brake disc bolt 23 N·m (2.3 kgf·m, 17 lb·ft) **LOCTITE®**

TIP

Tighten the brake disc bolts in stages and in a crisscross pattern.



- d. Measure the brake disc runout.
- e. If out of specification, repeat the adjustment steps until the brake disc runout is within specification.
- f. If the brake disc runout cannot be brought within specification, replace the brake disc.

- 5. Install:
 - Front wheel Refer to "FRONT WHEEL" on page 4-5.

REPLACING THE FRONT BRAKE

When replacing the brake pads, it is not sary to disconnect the brake hose or semble the brake caliper.

- Measure:
 - Brake pad wear limit "a" Out of specification → Replace the pads as a set.



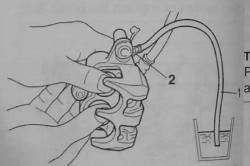
Brake pad lining thickness 4.3 mm (0.17 in) Limit 0.8 mm

- 2. Install:
 - · Brake pad support
 - · Brake pad spring
 - Brake pad

TIP

Always install new brake pads and a brake pad spring as a set.

******* a. Connect a clear plastic hose "1" tight the the bleed screw "2". Put the other enthe hose into an open container.



- b. Loosen the bleed screw and push brake caliper pistons into the brake cal with your finger.
- c. Tighten the bleed screw.



Bleed screw 14 N·m (1.4 kgf·m, 10 lb·ft)

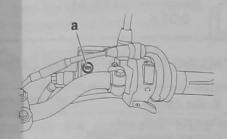
 d. Install new brake pads and a new brake pad spring.

3. Check:

· Brake fluid level

Below the minimum level mark "a" \rightarrow Add the recommended brake fluid to the proper level.

Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-14.



4. Check:

· Brake lever operation

Soft or spongy feeling \rightarrow Bleed the brake system.

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-16.

REMOVING THE FRONT BRAKE CALIPER

TIP.

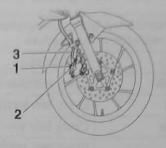
Before disassembling the brake caliper, drain the brake fluid from the entire brake system.

1. Remove:

- · Brake hose union bolt "1"
- · Copper washers "2"
- · Brake hose "3"

TIP

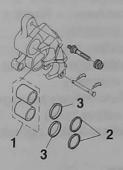
Put the end of the brake hose into a container and pump out the brake fluid carefully.



DISASSEMBLING THE FRONT BRAKE CALIPER

1. Remove:

- · Brake caliper pistons "1"
- · Brake caliper piston dust seals "2"
- · Brake caliper piston seals "3"



a. Blow compressed air into the brake hose joint opening "a" to force out the pistons from the brake caliper.

WARNING

- Cover the brake caliper piston with a rag. Be careful not to get injured when the piston is expelled from the brake caliper.
- Never try to pry out the brake caliper piston



 Remove the brake caliper piston seals and dust seals.

FRONT BRAKE CHAS

CHAS

CHECKING THE FRONT BRAKE CALIPER

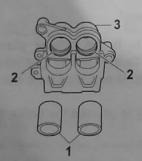
	ded brake component ement schedule
Brake pads	If necessary
Piston seals	Every two years
Dust seals	Every two years
Brake hose	Every four years
Brake fluid	Every two years and whenever the brake is disassembled

1. Check:

- Brake caliper pistons "1"
 Rust/scratches/wear → Replace the
 brake caliper pistons.
- Brake caliper cylinders "2"
 Scratches/wear → Replace the brake caliper assembly.
- Brake caliper body "3"
 Cracks/damage → Replace the brake caliper assembly.
- Brake fluid delivery passages (brake caliper body)
 Obstruction → Blow out with compressed air.

MARNING

Whenever a brake caliper is disassembled, replace the piston seals and dust seals.



2. Check:

Brake caliper bracket
 Cracks/damage → Replace.

ASSEMBLING THE FRONT BRAKE

A WARNING

- Before installation, all internal components should be cleaned lubricated with clean or new brake solvents on internal
- Never use solvents on internal components as they will cause the ton seals and dust seals to swell distort.
- Whenever a brake caliper is disabled, replace the brake caliper seals and dust seals.



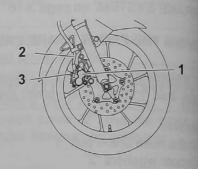
Recommended fluid DOT 4

INSTALLING THE FRONT BRAKE CALL

- 1. Install:
 - Brake caliper "1"
 (temporarily)
 - · Copper washers New
 - · Brake hose "2"
 - · Brake hose union bolt "3"

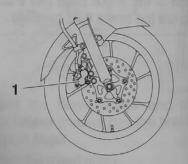


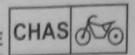
Brake hose union bolt 24 N·m (2.4 kgf·m, 18 lb·ft)



2. Remove:

· Brake caliper "1"





3. Install:

- . Brake pad spring
- · Brake pads
- · Brake caliper
- · Brake hose holder



Brake caliper bolt 35 N·m (3.5 kgf·m, 26 lb·ft) Brake hose holder 7 N·m (0.7 kgf·m, 5.2 lb·ft)

Refer to "REPLACING THE FRONT BRAKE PADS" on page 4-24.

4 Fill:

 Brake master cylinder reservoir (with the specified amount of the recommended brake fluid)



Recommended fluid DOT 4

WARNING

- Use only the designated brake fluid.
 Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.
- When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

NOTICE

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

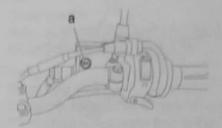
5. Bleed:

 Brake system Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-16.

6. Check:

Brake fluid level
 Below the minimum level mark "a" → Add
 the recommended brake fluid to the
 proper level.
 Refer to "CHECKING THE BRAKE

FLUID LEVEL" on page 3-14.



7. Check:

Brake lever operation
 Soft or spongy feeling → Bleed the brake system.

 Refer to "BLEEDING THE HYDRAULIC

REMOVING THE FRONT BRAKE MASTER CYLINDER

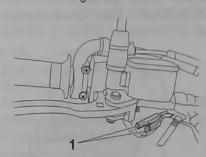
BRAKE SYSTEM" on page 3-16.

TIP.

Before removing the front brake master cylinder, drain the brake fluid from the entire brake system.

1. Disconnect:

· Front brake light switch connectors "1"

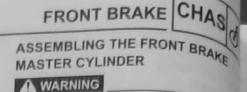


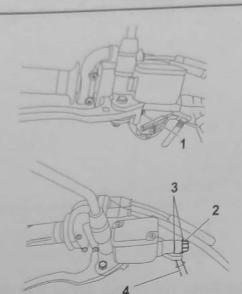
2. Remove:

- · Front brake light switch "1"
- Brake hose union bolt "2"
- · Copper washers "3"
- · Brake hose "4"

TIP

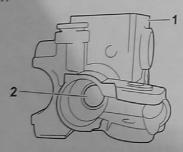
To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.





CHECKING THE FRONT BRAKE MASTER CYLINDER

- 1. Check:
 - · Brake master cylinder "1" Damage/scratches/wear → Replace.
 - · Brake fluid delivery passages "2" (brake master cylinder body) Obstruction → Blow out with compressed



- 2. Check:
 - · Brake master cylinder kit Damage/scratches/wear → Replace.
- 3. Check:
 - · Brake master cylinder reservoir Cracks/damage → Replace.
 - Brake master cylinder reservoir diaphragm Damage/wear → Replace.
- 4. Check:
 - Brake hose Cracks/damage/wear → Replace.

Before installation, all internal should be components should be clean lubricated with clean or new brake

Never use solvents on internal components.



Recommended fluid DOT 4

INSTALLING THE FRONT BRAKE MAL CYLINDER

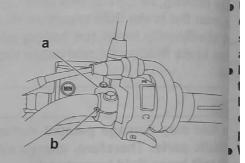
- 1. Install:
 - Brake master cylinder "1"
 - · Brake master cylinder holder "2"



Brake master cylinder holder 10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

- The front brake master cylinder should be installed with the arrow ma forward.
- Align the end of the brake master con holder with the punch mark "b" handlebar.
- First, tighten the front bolt, then the bolt.



- 2. Install:
 - Copper washers "1" New
 - · Brake hose "2"
 - Brake hose union bolt "3"



Brake hose union bolt 24 N·m (2.4 kgf·m, 18 lb·ft)

WARNING

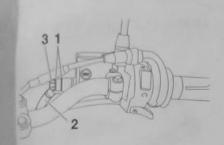
Proper brake hose routing is essentil insure safe vehicle operation.

ra

p

TIP

- Install the brake hose to the front brake master cylinder within the angle shown in the illustration.
- While holding the brake hose, tighten the brake hose union bolt as shown.
- Turn the handlebar to the left and right to make sure the brake hose does not touch other parts (e.g., wire harness, cables, leads). Correct if necessary.



3. Fill:

 Brake master cylinder reservoir (with the specified amount of the recommended brake fluid)



Recommended fluid DOT 4

MARNING

- Use only the designated brake fluid.
 Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.
- When refilling, be careful that water does not enter the brake master cylinder reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

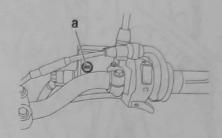
NOTICE

Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately. 4. Bleed:

 Brake system Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-16.

5. Check:

Brake fluid level
 Below the minimum level mark "a" → Add
 the recommended brake fluid to the
 proper level.
 Refer to "CHECKING THE BRAKE
 FLUID LEVEL" on page 3-14.



6. Check:

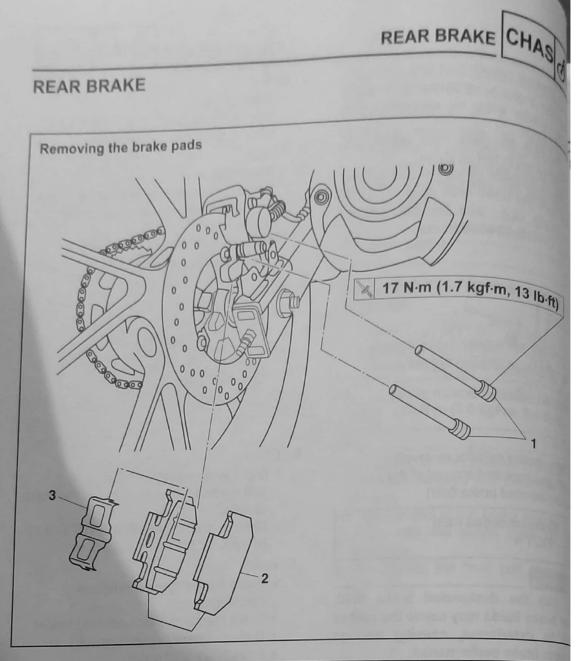
Brake lever operation
 Soft or spongy feeling → Bleed the brake
 system.
 Refer to "BLEEDING THE HYDRAULIC
 BRAKE SYSTEM" on page 3-16.

7. Install:

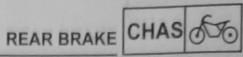
- Brake master cylinder reservoir diaphragm
- · Brake master cylinder reservoir holder
- · Brake master cylinder reservoir cap
- · Front brake light switch

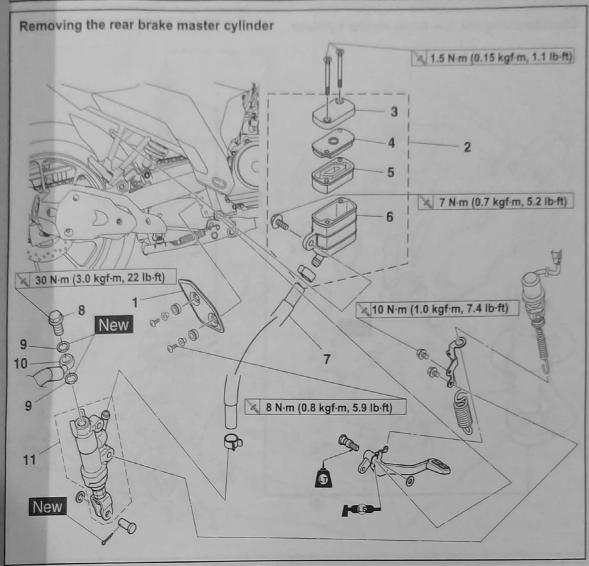
8. Connect:

· Front brake light switch connectors

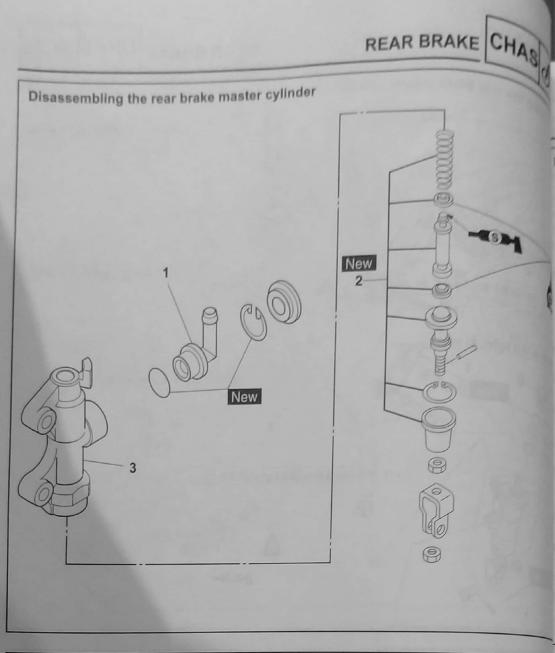


Order	Job/Parts to remove	Q'ty	Remarks
1	Brake pad pin	1	
2	Rear brake pad	2	
3	Brake pad spring	1	
			For installation, reverse the removal procedure.

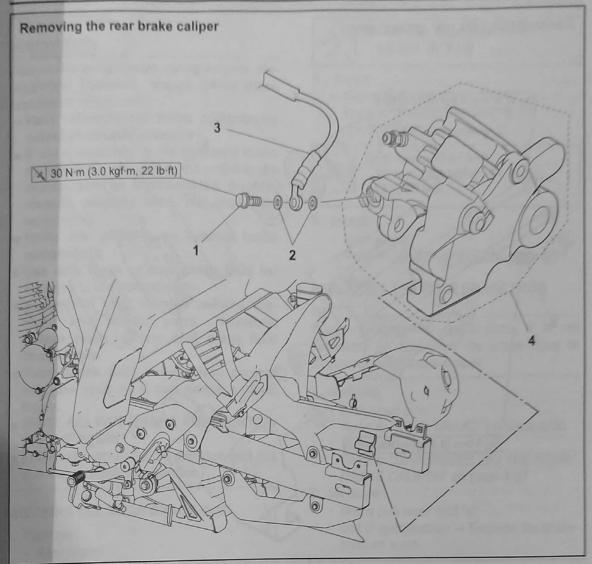




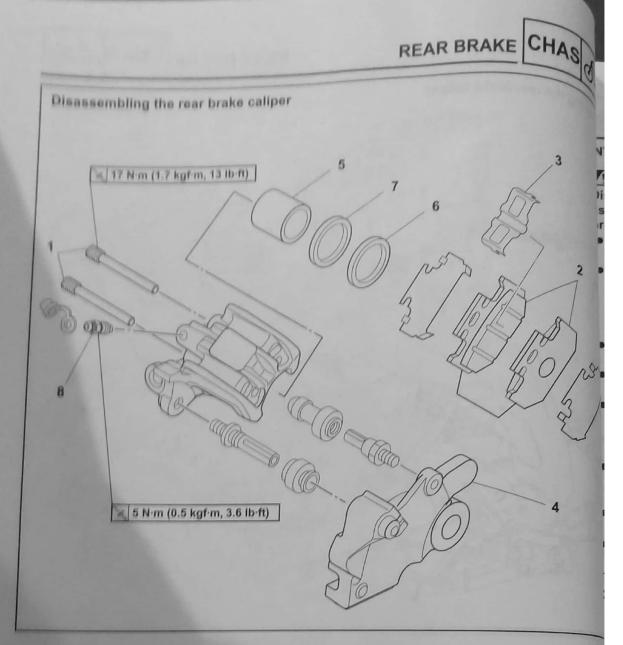
Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-16.
1	Footrest plate	1	
2	Brake fluid reservoir assembly	1	
3	Brake fluid reservoir cap	1	
4	Brake fluid reservoir diaphragm holder	1	
5	Brake fluid reservoir diaphragm	1	
6	Brake fluid reservoir	1	
7	Brake fluid reservoir hose	1	
8	Brake hose union bolt	1	
9	Copper washer	2	
10	Rear brake hose	1	
11	Rear brake master cylinder	1	
			For installation, reverse the removal procedure.



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake hose joint	1	
2	Brake master cylinder kit	1	
3	Brake master cylinder body	1	
			For assembly, reverse the disassembly procedure.



Order	Job/Parts to remove	Q'ty	Remarks
	Brake fluid		Drain. Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-16.
7 50	Rear wheel		Refer to "REAR WHEEL" on page 4-11.
1	Brake hose union bolt	1	Mark and Mark Mark
2	Copper washer	2	(100 mg
3	Rear brake hose	1	
4	Rear brake caliper	1	
			For installation, reverse the removal procedure.



Order	Job/Parts to remove	Q'ty	Remarks
1	Brake pad pin	2	The state of the s
2	Rear brake pad	2	
3	Brake pad spring	1	
4	Brake caliper bracket	1	
5	Brake caliper piston	1	
6	Brake caliper piston dust seal	1	
7	Brake caliper piston seal	1	
В	Bleed screw	1	
			For assembly, reverse the disassembly procedure.

INTRODUCTION

WARNING

Disc brake components rarely require disassembly. Therefore, always follow these preventive measures:

- Never disassemble brake components unless absolutely necessary.
- If any connection on the hydraulic brake system is disconnected, the entire brake system must be disassembled, drained, cleaned, properly filled, and bled after reassembly.
- Never use solvents on internal brake components.
- Use only clean or new brake fluid for cleaning brake components.
- Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.
- Avoid brake fluid coming into contact with the eyes as it can cause serious injury.
- FIRST AID FOR BRAKE FLUID ENTER-ING THE EYES:
- Flush with water for 15 minutes and get immediate medical attention.

CHECKING THE REAR BRAKE DISC

- 1. Remove:
 - Rear wheel Refer to "REAR WHEEL" on page 4-11.
- 2. Check:
 - Brake disc
 Damage/galling → Replace.
- 3. Measure:
 - Brake disc runout
 Out of specification → Correct the brake
 disc runout or replace the brake disc.
 Refer to "CHECKING THE REAR
 BRAKE DISC" on page 4-35.



Brake disc runout limit 0.10 mm (0.0039 in)

4. Measure:

Brake disc thickness
 Measure the brake disc thickness at a
 few different locations.
 Out of specification → Replace.
 Refer to "CHECKING THE REAR
 BRAKE DISC" on page 4-35.



Brake disc thickness limit 4.0 mm (0.16 in)

- 5. Adjust:
 - Brake disc runout Refer to "CHECKING THE REAR BRAKE DISC" on page 4-35.



Rear brake disc bolt 23 N·m (2.3 kgf·m, 17 lb·ft) LOCTITE®

- 6. Install:
 - Rear wheel Refer to "REAR WHEEL" on page 4-11.

REPLACING THE REAR BRAKE PADS

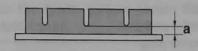
TIF

When replacing the brake pads, it is not necessary to disconnect the brake hose or disassemble the brake caliper.

- 1. Remove:
 - Brake pad pins Refer to "REAR BRAKE" on page 4-30.
 - Brake pad
 Refer to "DISASSEMBLING THE REAR
 BRAKE CALIPER" on page 4-37.
- 2. Measure:
 - Brake pad wear limit "a"
 Out of specification → Replace the brake pads as a set.



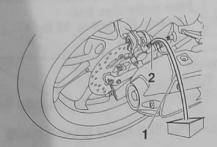
Brake pad lining thickness 5.5 mm (0.22 in) Limit 1.5 mm (0.06 in)



- 3. Install:
 - · Brake pad spring
 - · Brake pads

Always replace the brake pads, and brake pad spring as a set.

a. Connect a clear plastic hose "1" tightly to the bleed screw "2". Put the other end of the hose into an open container.

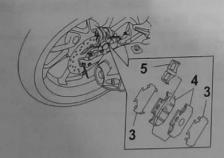


- b. Loosen the bleed screw and push the brake caliper pistons into the brake caliper with your finger.
- c. Tighten the bleed screw.



Bleed screw 5 N·m (0.5 kgf·m, 3.6 lb·ft)

- d. Install a new brake pad shim "3" onto each new brake pad "4".
- e. Install new brake pads and a new brake pad spring "5".

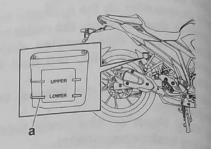


- 3. Install:
 - · Brake pad pins
 - Screw plug



Brake pad pins 17 N·m (1.7 kgf·m, 13 lb·ft) 4. Check:

 Brake fluid level Below the minimum level mark "a" the recommended brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-14



5. Check:

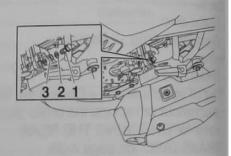
· Brake pedal operation Soft or spongy feeling → Bleed the Refer to "BLEEDING THE HYDRAIL BRAKE SYSTEM" on page 3-16

REMOVING THE REAR BRAKE CALIPE

Before removing the brake caliper, drain brake fluid from the entire brake system

1. Remove:

- Brake hose union bolt "1"
- · Copper washers "2"
- · Brake hose "3"



Put the end of the brake hose into a conta and pump out the brake fluid carefully.

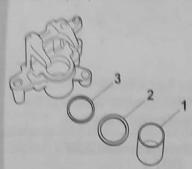
2. Remove:

- · Rear wheel Refer to "REAR WHEEL" on page 4
- Brake caliper Refer to "REMOVING THE REAR BRAKE CALIPER" on page 4-36.

DISASSEMBLING THE REAR BRAKE CALIPER

1. Remove:

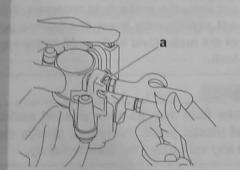
- * Brake caliper piston "1"
- · Brake caliper piston dust seal "2"
- · Brake caliper piston seal "3"



a. Blow compressed air into the brake hose joint opening "a" to force out the piston from the brake caliper.

WARNING

- Cover the brake caliper piston with a rag. Be careful not to get injured when the piston is expelled from the brake caliper.
- Never try to pry out the brake caliper piston.



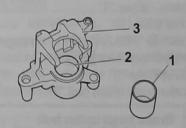
b. Remove the brake caliper piston seal and dust seal.

CHECKING THE REAR BRAKE CALIPER

Recommended brake component replacement schedule		
Brake pads	If necessary	
Piston seals	Every two years	
Piston dust seals	Every two years	
Brake hose	Every four years	
Brake fluid	Every two years and whenever the brake is disassembled	

1. Check:

- Brake caliper piston "1" Rust/scratches/wear → Replace the brake caliper piston.
- Brake caliper cylinder "2"
 Scratches/wear → Replace the brake caliper assembly.
- Brake caliper body "3"
 Cracks/damage → Replace the brake caliper assembly.
- Brake fluid delivery passages (brake caliper body)
 Obstruction → Blow out with compressed air.



WARNING

Whenever a brake caliper is disassembled, replace the brake caliper piston dust seal and piston seal.

CHECKING THE REAR BRAKE CALIPER BRACKET

- 1. Check:
 - Rear brake caliper bracket Cracks/damage → Replace.

ASSEMBLING THE REAR BRAKE CALIPER

A WARNING

- Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.
- Never use solvents on internal brake components as they will cause the brake caliper piston dust seal and piston seal to swell and distort.
- Whenever a brake caliper is disassembled, replace the brake caliper piston dust seal and piston seal.



Recommended fluid DOT 4

INSTALLING THE REAR BRAKE CALIPER

- 1. Install:
 - · Brake pad spring
 - · Brake pads
 - Brake pad pin bolts
 Refer to "REPLACING THE REAR BRAKE PADS" on page 4-35.



Rear brake pad pin bolt 17 N·m (1.7 kgf·m, 13 lb·ft)

- 2. Install:
 - · Brake caliper "1"
 - Rear wheel Refer to "REAR WHEEL" on page 4-11.
 - · Copper washers New
 - · Brake hose "2"
 - Brake hose union bolt "3"



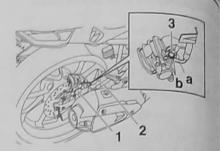
Brake hose union bolt 30 N·m (3.0 kgf·m, 22 lb·ft)

WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-24.

NOTICE

When installing the brake hose onto the brake caliper "1", make sure the brake pipe "a" touches the projection "b" on the brake caliper.



3. Fill:

 Brake fluid reservoir (with the specified amount of the recommended brake fluid)



Recommended fluid

WARNING

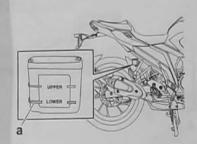
- Use only the designated brake fluids may cause the ruble seals to deteriorate, causing leak, and poor brake performance.
- Refill with the same type of brake fithat is already in the system. Mix brake fluids may result in a harm chemical reaction, leading to poor braperformance.
- When refilling, be careful that water do not enter the brake fluid reservoir. Wa will significantly lower the boiling po of the brake fluid and could cause value.

NOTICE

Brake fluid may damage painted surface and plastic parts. Therefore, always cle up any spilt brake fluid immediately.

4. Bleed:

- Brake system
 Refer to "BLEEDING THE HYDRAULI
 BRAKE SYSTEM" on page 3-16.
- 5. Check:
 - Brake fluid level
 Below the minimum level mark "a" → k
 the recommended brake fluid to the
 proper level.
 Refer to "CHECKING THE BRAKE
 FLUID LEVEL" on page 3-14.



6. Check:

Brake pedal operation
 Soft or spongy feeling → Bleed the brake system.

 Refer to "BLEEDING THE HYDRAULIC"

Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-16.

REMOVING THE REAR BRAKE MASTER CYLINDER

TIP

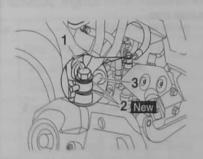
Before removing the rear brake master cylinder, drain the brake fluid from the entire brake system.

1. Remove:

- · Brake hose union bolt "1"
- · Copper washers "2"
- · Brake hose "3"

ГIР

To collect any remaining brake fluid, place a container under the master cylinder and the end of the brake hose.



CHECKING THE REAR BRAKE MASTER CYLINDER

1. Check:

- Brake master cylinder
 Damage/scratches/wear → Replace the
 brake master cylinder assembly.
- Brake fluid delivery passages (brake master cylinder body)
 Obstruction → Blow out with compressed air.

2. Check:

Brake master cylinder kit
 Damage/scratches/wear → Replace the
 brake master cylinder kit.

3. Check:

- · Brake fluid reservoir
- Cracks/damage → Replace the reservoir tank
- Brake fluid reservoir diaphragm Cracks/damage → Replace the brake fluid reservoir diaphragm.

4. Check:

Brake hoses
 Cracks/damage/wear → Replace the brake hose.

ASSEMBLING THE REAR BRAKE MASTER CYLINDER

WARNING

- Before installation, all internal brake components should be cleaned and lubricated with clean or new brake fluid.
- Never use solvents on internal brake components.



Recommended fluid DOT 4

INSTALLING THE REAR BRAKE MASTER CYLINDER

1. Install:

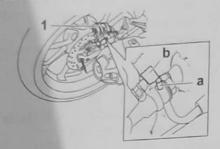
- Brake hose "1"
- Copper washers "2" New
- · Brake hose union bolt "3"

WARNING

Proper brake hose routing is essential to insure safe vehicle operation. Refer to "CABLE ROUTING" on page 2-24.

NOTICE

When installing the brake hose onto the brake caliper "1", make sure the brake pipe "a" touches the projection "b" on the brake caliper.



2. Fill:

 Brake fluid reservoir (with the specified amount of the recommended brake fluid)



Recommended fluid DOT 4

WARNING

- Use only the designated brake fluid. Other brake fluids may cause the rubber seals to deteriorate, causing leakage and poor brake performance.
- Refill with the same type of brake fluid that is already in the system. Mixing brake fluids may result in a harmful chemical reaction, leading to poor brake performance.
- When refilling, be careful that water does not enter the brake fluid reservoir. Water will significantly lower the boiling point of the brake fluid and could cause vapor lock.

NOTICE

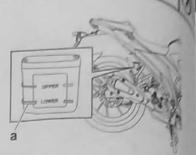
Brake fluid may damage painted surfaces and plastic parts. Therefore, always clean up any spilt brake fluid immediately.

3. Bleed:

 Brake system Refer to "BLEEDING THE HYDRAULIC BRAKE SYSTEM" on page 3-16.

4. Check:

· Brake fluid level Below the minimum level mark "a" → Add the recommended brake fluid to the proper level. Refer to "CHECKING THE BRAKE FLUID LEVEL" on page 3-14.



REAR BRAKE CHAS

5. Check:

· Brake pedal operation Brake pedal op ... Soft or spongy feeling → Bleed the Refer to "BLEEDING THE HYDRA REFER SYSTEM" on page 3 144 BRAKE SYSTEM" on page 3-16

6. Adjust:

· Brake pedal position Refer to "ADJUSTING THE REAR BRAKE" on page 3-19 of base services.



Brake pedal position 43.0 mm (1.69 in)

7. Adjust:

 Rear brake light operation timing Refer to "ADJUSTING THE READ BRAKE LIGHT SWITCH" on page

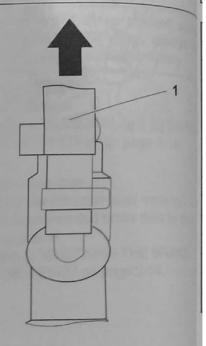
REAR BRAKE HOSE INSTALLATION

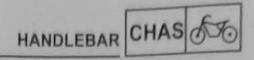
Install:

· Brake hose (reserve) "1"

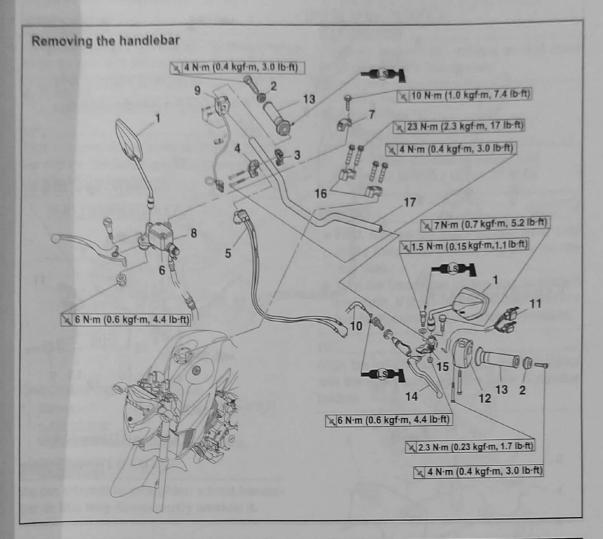
TIP.

Rear brake hose should be installed upright direction. If not upright, possible in ing to rear arm.

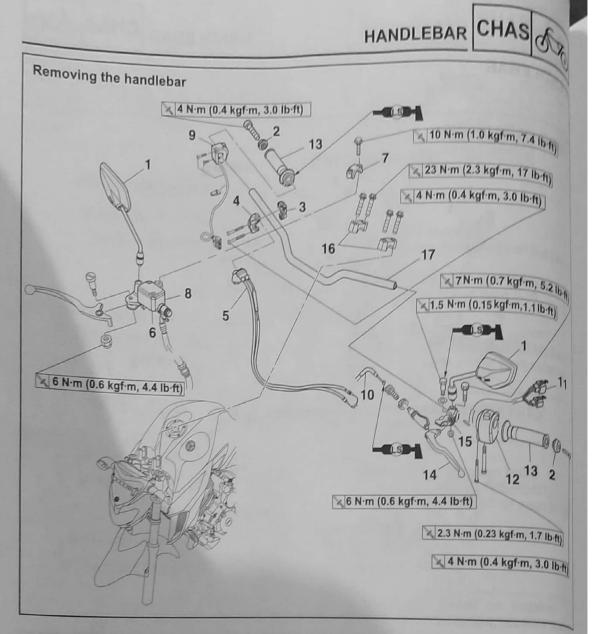




HANDLEBAR

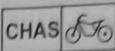


Order	Job/Parts to remove	Q'ty	Remarks
1	Rear view mirror (LH & RH)	2	satisfaction (Angel) 50
2	Grip end	2	- National republication of the last
3	Throttle grip cap upper	1	Total Committee of the
4	Throttle grip cap under	1	
5	Throttle cables	1	
6	Front brake light switch connector	2	Disconnect.
7	Front brake master cylinder holder	1	
8	Front brake master cylinder assembly	1	
9	Right handlebar switch	1	
10	Clutch cable	1	
11	Clutch switch coupler	1	Disconnect.
12	Left handlebar switch	1	
13	Handlebar grip	1	
14	Clutch lever	1	



Order	Job/Parts to remove	Q'ty	Remarks
15	Clutch lever holder	1	
16	Upper handlebar holder	2	The state of the s
17	Handlebar	1	The second second second
			For installation, reverse the removal procedure.

HANDLEBAR CHAS



REMOVING THE HANDLEBAR

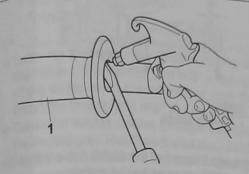
Stand the vehicle on a level surface.

WARNING

securely support the vehicle so that there is no danger of it falling over.

- 2. Remove:
 - · Handlebar grip "1"

Blow compressed air between the left handlebar and the handlebar grip, and gradually push the grip off the handlebar.



CHECKING THE HANDLEBAR

- 1. Check:
 - Handlebar
 - Bends/cracks/damage → Replace.

WARNING

Do not attempt to straighten a bent handlebar as this may dangerously weaken it.

INSTALLING THE HANDLEBAR

1. Stand the vehicle on a level surface.

WARNING

Securely support the vehicle so that there is no danger of it falling over.

- 2. Install:
 - · Handlebar "1"
 - Upper handlebar holders "2"



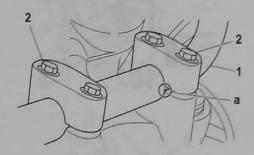
Upper handlebar holder bolt 23 N·m (2.3 kgf·m, 17 lb·ft)

NOTICE

- First, tighten the bolts on the front side of the handlebar holder, and then on the rear side.
- Turn the handlebar all the way to the left and right. If there is any contact with the fuel tank, adjust the handlebar position.

TIP

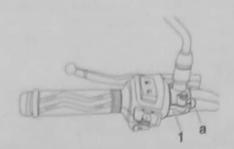
Align the match marks "a" on the handlebar with the upper surface of the lower handlebar holders.





- 3. Install:
 - · Clutch lever holder "1"

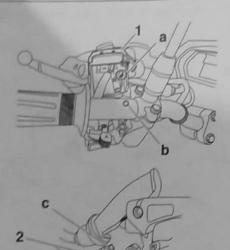
Align the slit of the clutch lever holder with the match mark "a" on the handlebar



Install:

· Left handlebar switch "1"

- Align the projections "a" on the left handlebar switch with the hole "b" in the handle-
- Install the clutch switch "2" in such a way that the drain hole "c" is located facing downwards.

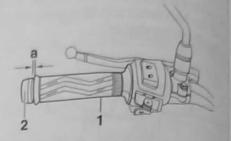


- 5. Install:
 - Handlebar grip "1"
 - · Grip end "2"
- a. Apply a thin coat of rubber adhesive onto the left end of the handlebar.
- b. Slide the handlebar grip over the left end of the handlebar.
- c. Wipe off any excess rubber adhesive with a clean rag.

A WARNING

Do not touch the handlebar grip rubber adhesive has fully dried

There should be less than 3 mm of a "a" between the handlebar grip and

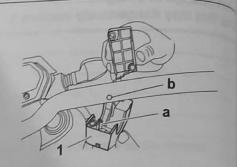


- 6. Install:
 - Clutch cable

Lubricate the end of the clutch cable with a coat of lithium-soap-based grease.

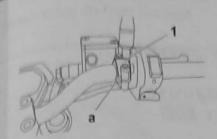
- 7. Install:
 - · Right handlebar switch "1"

Align the projections "a" on the right handle switch with the hole "b" in the handlebar



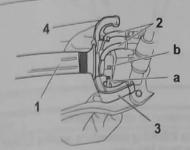
- 8. Install:
 - · Brake master cylinder
 - Brake master cylinder holder Refer to "INSTALLING THE FRONT BRAKE MASTER CYLINDER" on page 4-28.
- 9. Install:
 - Front brake lever holder "1"

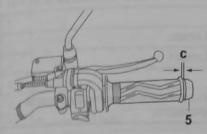
Align the slit of the front brake lever holderw the match mark "a" on the handlebar.



10. Install:

- . Throttle grip "1"
- . Throttle cables "2"
- Throttle grip cap upper "3"
- Throttle grip cap under "4"
- Grip end "5"
- Lubricate the end of the throttle cables and the inside of the throttle grip with a thin coat of the lithium-soap-based grease, and then install the throttle grip onto the handlebar.
- Route the throttle cables through the slot in the throttle grip, and then install the cables.
- Align the projection "a" on the throttle grip cap upper with the hole "b" in the handlebar.
- There should be 1-3 mm of clearance "c" between the throttle grip and the grip end.





11. Slide the throttle cable rubber cover back to its original position.

12. Adjust:

· Clutch cable free play Refer to "ADJUSTING THE CLUTCH LEVER FREE PLAY" on page 3-11.



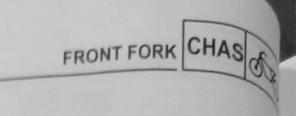
Clutch lever free play 10.0-15.0 mm

13. Adjust:

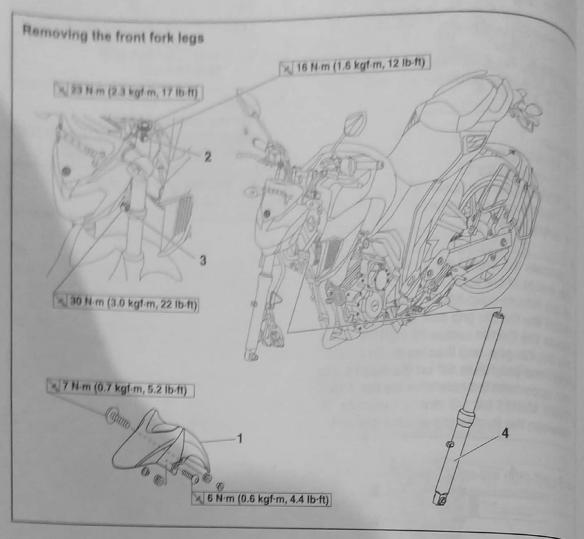
· Throttle cable free play Refer to "ADJUSTING THE THROTTLE GRIP FREE PLAY" on page 3-7.



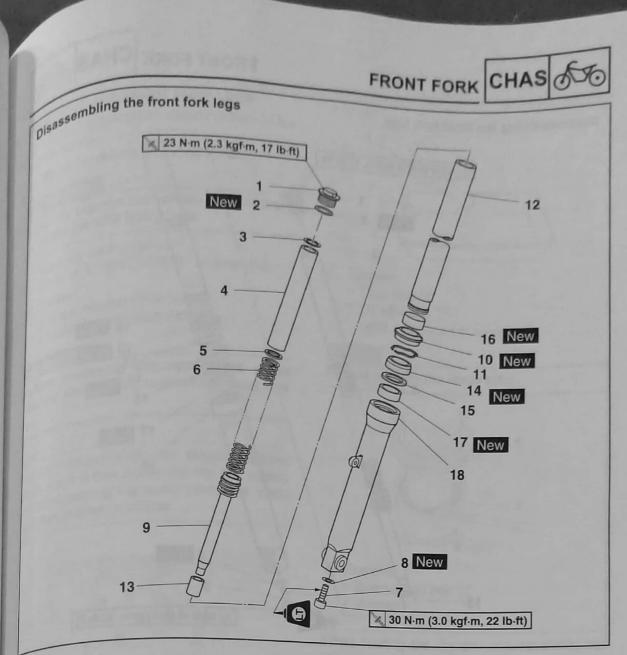
Throttle grip free play 3.0-5.0 mm



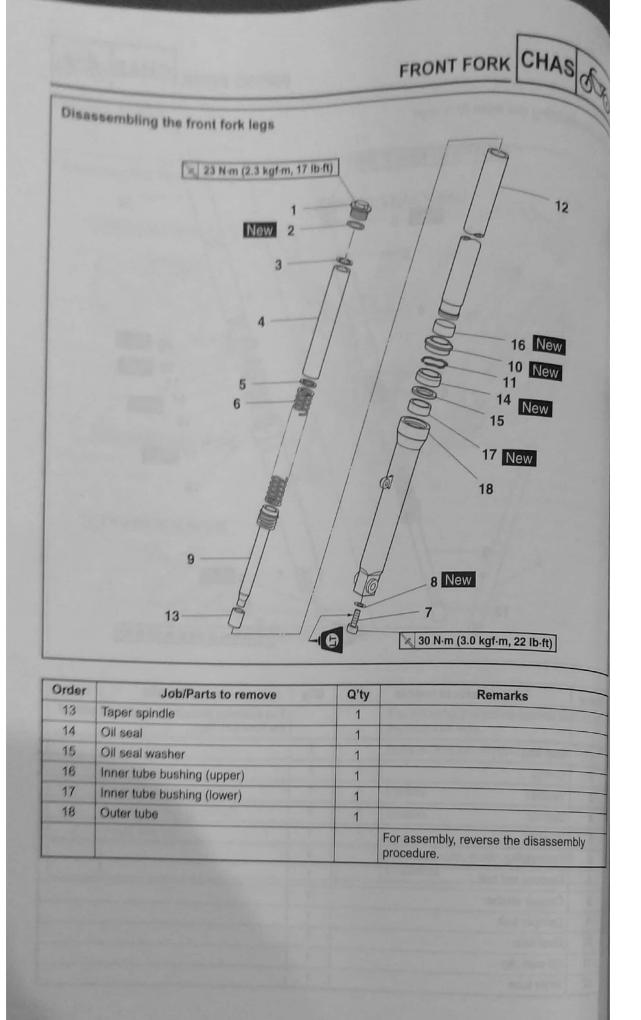
FRONT FORK



Order	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front fork legs.
	Front wheel		Refer to "FRONT WHEEL" on page 4-5.
1	Front fender	1	The state of page 4-5.
2	Upper bracket pinch bolt	1	Loosen.
3	Lower bracket pinch bolt	1	Loosen.
4	Front fork leg	1	2003611.
			For installation, reverse the removal procedure.



rder	Job/Parts to remove	Q'ty	Remarks
			The following procedure applies to both of the front fork legs.
1	Cap bolt	1	
2	O-ring	1	The second section of the
3	Washer	1	I Think many and was to
4	Spacer	1	
5	Washer	1	
6	Fork spring	1	
7	Damper rod bolt	1	The state of the s
8	Copper washer	1	
9	Damper bolt	1	
0	Dust seal	1	T. VELTANI
1	Oil seal clip	1	
12	Inner tube	1	



4-48

FRONT FORK CHAS

REMOVING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Stand the vehicle on a level surface.

A WARNING

securely support the vehicle so that there is no danger of it falling over.

- 2. Remove the front wheel. Refer to "FRONT WHEEL" on page 4-5.
- - . Upper bracket pinch bolt "1"
 - · Lower bracket pinch bolt "2"

WARNING

Before loosening the upper and lower bracket pinch bolts, support the front fork leg-

For easy removal of cap bolt, loosen the upper pinch bolt first then loosen the cap bolt slightly without loosening the lower pinch bolt while front fork is fitted on vehicle.



- 4. Remove:
 - · Front fork leg

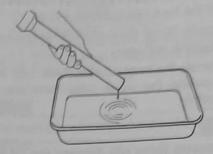
DISASSEMBLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

- 1. Drain:
 - · Fork oil

TIP_

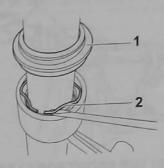
Stroke the inner tube several times while draining the fork oil.



- 2. Remove:
 - · Dust seal "1"
 - · Oil seal clip "2" (with a flat-head screwdriver)

NOTICE

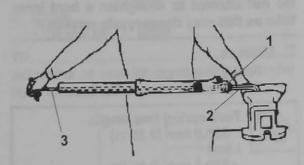
Do not scratch the inner tube.



- 3. Remove:
 - · Damper rod bolt "1"
 - Washer

TIP .

While holding the damper rod assembly bolt "1" with the hexagon socket wrench (8 mm) "2", loosen the damper rod assembly bolt "1" with T-handle "3".





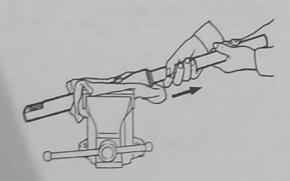
T-handle **YSST-813**

- 4. Remove:
 - · Inner tube

- a. Hold the front fork leg horizontally.
- Securely clamp the brake caliper bracket in a vice with soft jaws.
- Separate the inner tube from the outer tube by pulling the inner tube forcefully but smoothly.

NOTICE

- Excessive force will damage the oil seal and bushing. A damaged oil seal or bushing must be replaced.
- Avoid bottoming the inner tube into the outer tube during the above procedure, as the oil flow stopper will be damaged.



CHECKING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

- 1. Check:
 - · Inner tube
 - Outer tube Bends/damage/scratches → Replace.

A WARNING

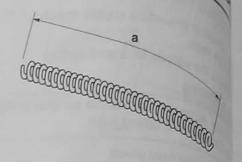
Do not attempt to straighten a bent inner tube as this may dangerously weaken it.

2. Measure:

Spring free length "a"
 Out of specification → Replace.



Fork spring free length 235.0 mm (9.25 in) Limit 230.3 mm (9.07 in)



3. Check:

- Damper rod
 Damage/wear → Replace.

 Obstruction → Blow out all of the passages with compressed air.
- Oil flow stopper Damage → Replace.

NOTICE

When disassembling and assembling front fork leg, do not allow any fore material to enter the front fork.

ASSEMBLING THE FRONT FORK LEGS

The following procedure applies to both of front fork legs.

WARNING

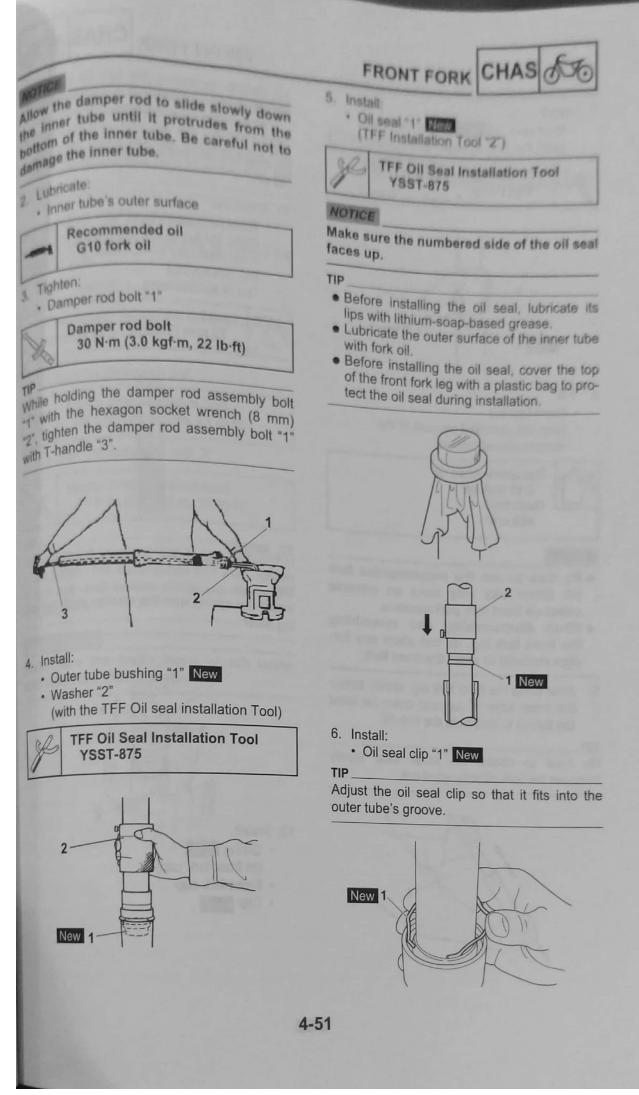
- Make sure the oil levels in both front for legs are equal.
- Uneven oil levels can result in poor had dling and a loss of stability

TIP

- When assembling the front fork leg, be su to replace the following parts:
 - Inner tube bushing (upper)
 - Inner tube bushing (lower)
 - Oil seal
 - Dust seal
 - Clip
 - O-ring (cap bolt)
- Before assembling the front fork leg, make sure all of the components are clean.

1. Install:

· Damper rod



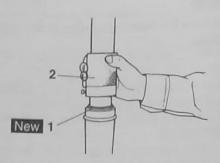


7. Install:

 Dust seal "1" New (with the TFF oil seal installation tool "2")



TFF Oil Seal Installation Tool YSST-875



8. Fill:

· Front fork leg (with the specified amount of the recommended fork oil)



Recommended oil G10 fork oil Quantity 469 cm³

NOTICE

- · Be sure to use the recommended fork oil. Other oils may have an adverse effect on front fork performance.
- When disassembling and assembling the front fork leg, do not allow any foreign material to enter the front fork.
- 9. After filling the front fork leg, slowly stroke the inner tube "1" up and down (at least ten times) to distribute the fork oil.

TIP Be sure to stroke the inner tube slowly because the fork oil may spurt out.

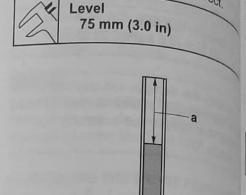


10. Before measuring the fork on minutes until the oil has Before measured the oil has settled the bubbles have dispersed.

TIP ______ Be sure to bleed the front fork leg of an

11. Measure:

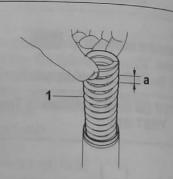
 Front fork leg oil level "a" (from the top of the inner tube tube fully compressed (from the top of tube tube inner tube fully compressed and which spring) Out of specification → Correct,



12. Install:

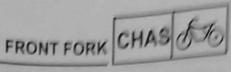
· Fork spring "1"

Install the spring with the smaller pitch a ing down.



13. Install:

- O-ring New (to front fork cap)
- · Front fork cap
- · Clip New



Before installing the front fork cap, lubricate its O-ring with grease.

its of the front fork cap into the inner tube, and then install the clip, making sure that the cap is securely held in place with the clip.

INSTALLING THE FRONT FORK LEGS

The following procedure applies to both of the front fork legs.

1. Install:

· Front fork leg Temporarily tighten the upper and lower bracket pinch bolts.

2. Tighten:

. Upper bracket pinch bolt "1"



Lower bracket pinch bolt 30 N·m (3.0 kgf·m, 22 lb·ft)

. Lower bracket pinch bolt "2"



Upper bracket pinch bolt 16 N·m (1.6 kgf·m, 12 lb·ft)

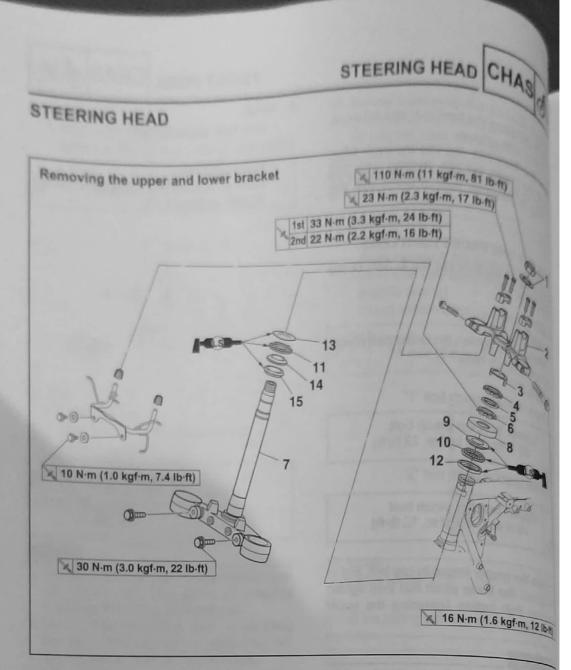
To give the proper torque to cap bolt, first of all tighten the lower pinch bolt then tighten the cap bolt before tightening the upper pinch bolt.

WARNING

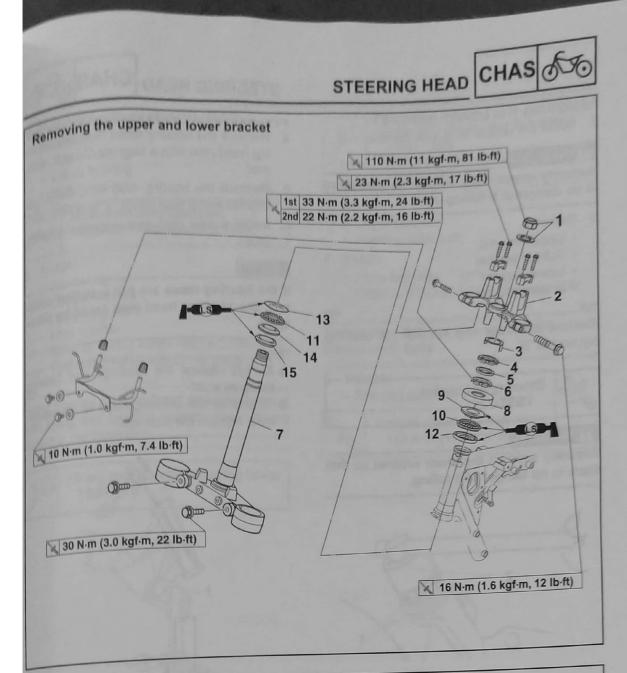
Make sure the brake hose, clutch cable, and leads are routed properly.



- 3. Install:
 - Headlight adjusting bolt
- 4. Adjust:
 - · Headlight beam Refer to "ADJUSTING THE HEADLIGHT BEAM" on page 3-23.



Order	Job/Parts to remove	Q'ty	Remarks
170	Head light assy.		Refer to "GENERAL CHASSIS" on page 4-2.
	Front fork legs		Refer to "FRONT FORK" on page 4-46
1	Steering stem nut/washer	1	. 5-11
2	Upper bracket	1	
3	Lock washer	1	M. P. L. W.
4	Upper ring nut	1	
5	Rubber washer	1	
6	Lower ring nut	1	
7	Lower bracket	1	
8	Bearing cover	1	50 (200)
9	Upper bearing inner race	1	
10	Upper bearing	1	
11	Lower bearing	1	



	Job/Parts to remove	Q'ty	Remarks
Order	Upper bearing outer race	1	3/10/10/10/10/10/10/10/10/10/10/10/10/10/
-		1	
13	Lower bearing outer race	1	The second secon
14	Lower bearing inner race	1	
15	Dust seal		For installation, reverse the removal procedure.

STEERING HEAD CHAS

REMOVING THE LOWER BRACKET

1. Stand the vehicle on a level surface.

WARNING

Securely support the vehicle so that there is no danger of it falling over.

- 2. Remove:
 - Upper ring nut
 - · Rubber washer
 - · Lower ring nut "1"
 - · Lower bracket

TIP

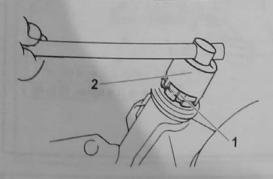
Remove the lower ring nut with the steering nut socket "2".



Steering nut socket YSST-721

WARNING |

Securely support the lower bracket so that there is no danger of it falling.



CHECKING THE STEERING HEAD

- 1. Wash:
 - · Bearings
 - · Bearing races



Recommended cleaning solvent Kerosene

- 2. Check:
 - · Bearings
 - · Bearing races Damage/pitting → Replace.
- 3. Replace:
 - · Bearings
 - · Bearing races

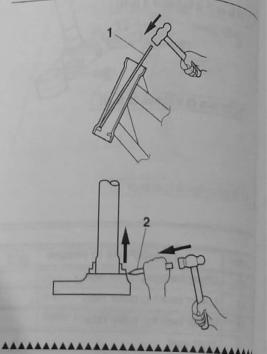
- a. Remove the bearing races from the Remove the both a long rod "1" and and
- b. Remove the bearing race from the
- bracket with bracket with a new dust seal and new bear

NOTICE

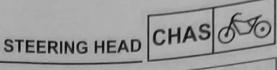
If the bearing races are not installed by the steering head pipe could be If the bearing head pipe could be done aged.

TIP.

- Always replace the bearings and bearings races as a set.
- Whenever the steering head is disassen bled, replace the dust seal.



- 4. Check:
 - Upper bracket
 - · Lower bracket (along with the steering stem) Bends/cracks/damage → Replace.



INSTALLING THE STEERING HEAD

- Lubricate:
 1. Upper bearing
 - . Lower bearing
 - . Bearing races

Recommended lubricant Lithium-soap-based grease

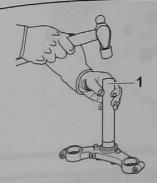


- Install: . Lower ring nut
- . Rubber washer
- . Upper ring nut
- . Lock washer Refer to "CHECKING AND ADJUSTING THE STEERING HEAD" on page 3-18.

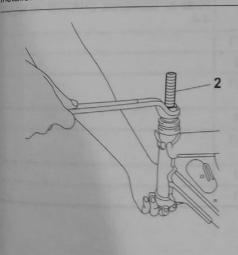
TIP lost lost bearing steering lower on under bracket with fixing tool bearing steering lower "1" as shown in the illustration.



Fixing tool bearing steering lower YSST-670



Install the upper and lower outer races by using special tool upper and lower race installer "2"



Upper and lower race installer YSST - 626 Upper race installer attachment YSST-1226

- 3. Install:
 - · Upper bracket
 - · Steering stem bolt
- 4. Install:
 - · Front fork legs Refer to "FRONT FORK" on page 4-46.

Temporarily tighten the upper and lower bracket pinch bolts.

- 5. Tighten:
 - · Steering stem nut

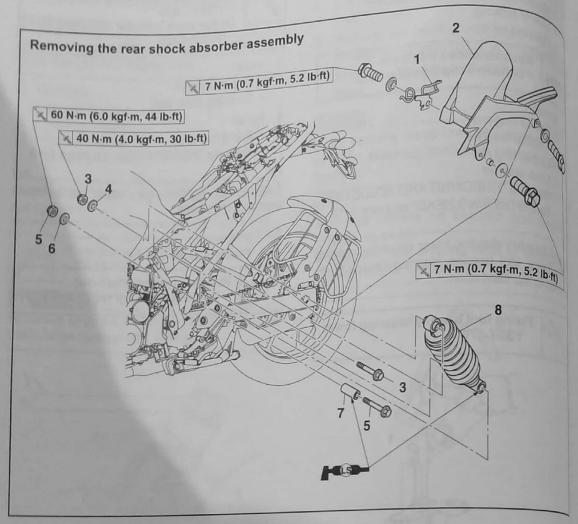


Handle steering stem nut 110 N·m (11.0 kgf·m, 81 lb·ft)

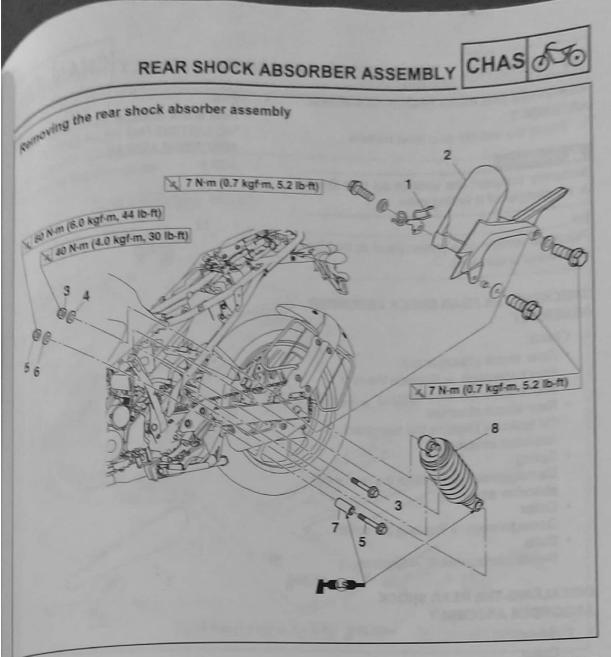
REAR SHOCK ABSORBER ASSEMBLY CHAS



REAR SHOCK ABSORBER ASSEMBLY



Order	Job/Parts to remove	Q'ty	Remarks
0.001	Passenger seat, Rider seat, Left side cover, Right side cover, Tail cover, Left rear side cover	10 m	Refer to "GENERAL CHASSIS" on page 4-1.
	Air filter case assembly		Refer to "GENERAL CHASSIS" on page 4-4.
1	Rear brake hose holder	1/1	
2	Rear fender	1	
3	Rear shock absorber assembly upper nut/ washer	1/1	
4	Rear shock absorber assembly upper bolt	1	
5	Rear shock absorber assembly lower nut/ washer	1/1	239/14/
6	Rear shock absorber assembly lower bolt	1	
7	Collar	1	



Job/Parts to remove	Q'ty	Remarks
Rear shock absorber assembly	1	
Notification of the second of		For installation, reverse the removal procedure

REAR SHOCK ABSORBER ASSEMBLY CHAS

REMOVING THE REAR SHOCK ABSORBER ASSEMBLY

1. Stand the vehicle on a level surface.

A WARNING

Securely support the vehicle so that there is no danger of it falling over.

TIP

Place the vehicle on a center stand so that the rear wheel is elevated.

CHECKING THE REAR SHOCK ABSORBER **ASSEMBLY**

- 1. Check:
 - · Rear shock absorber rod Bends/damage → Replace the rear shock absorber assembly.
 - · Rear shock absorber Oil leaks → Replace the rear shock absorber assembly.
 - Spring Damage/wear → Replace the rear shock absorber assembly.
 - Collar Damage/wear → Replace the collar.
 - Bolts Bends/damage/wear → Replace.

INSTALLING THE REAR SHOCK ABSORBER ASSEMBLY

- 1. Lubricate:
 - · Collar
 - Rear shock absorber lower seal



Recommended lubricant Lithium-soap-based grease

- 2. Install:
 - · Rear shock absorber assembly
- 3. Tighten:
 - Rear shock absorber assembly upper nut



Rear shock absorber assembly upper nut 40 N·m (4.0 kgf·m, 30 lb·ft)

· Rear shock absorber assembly lower nut

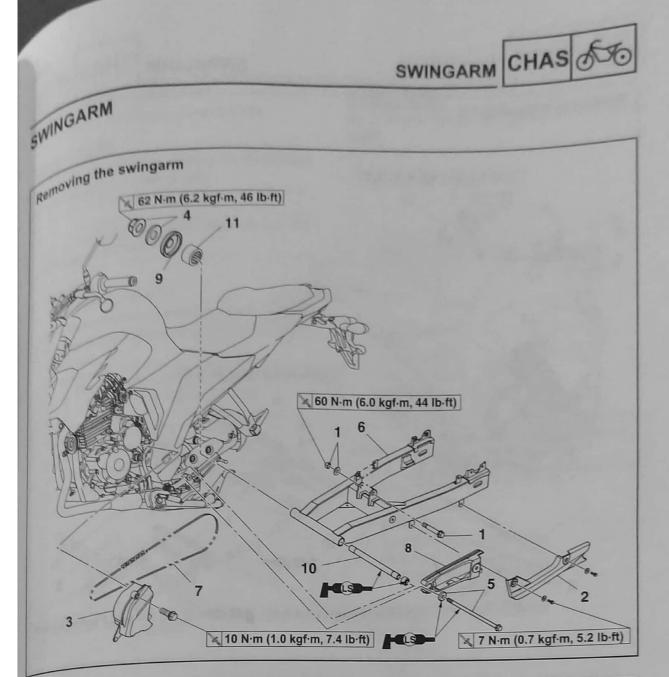


Rear shock absorber assembly lower nut 60 N·m (6.0 kgf·m, 44 lb·ft)

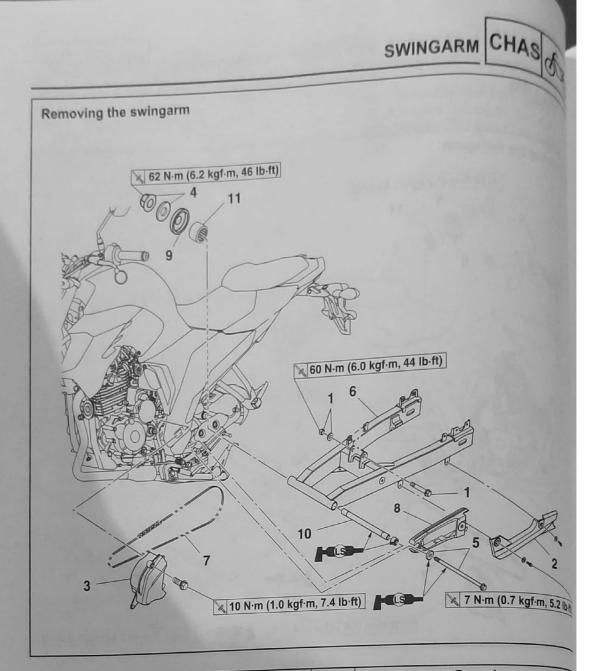
4. Adjust

Adjust

Rear shock absorber assy. (Refer to the shock absorber assy.) "ADJUSTING THE REAR SHOCK ABSORBER ASSEMBLY" on page



Ordor	Job/Parts to remove	Q'ty	Remarks
Order	Mud protector		Refer to "GENERAL CHASSIS" on page 4-1.
	Rear wheel		Refer to "REAR WHEEL" on page 4-11.
	Rear fender		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-58.
1	Rear shock absorber assembly lower bolt/ nut and washer	1/1	
2	Chain protector	1	
3	Chain case cover	1	
4	Pivot shaft nut/washer	1/1	
5	Pivot shaft/washer	1/1	
6	Swingarm	1	
7	Chain	1	
8	Seal guard	1	
9	Thrust cover	2	
10	Collar	1	



Order	Job/Parts to remove	Q'ty	Remarks
11	Bearing	2	software least
11	Dodring		For installation, reverse the removal procedure.

REMOVING THE SWINGARM Stand the vehicle on a level surface.

securely support the vehicle so that there securely adapter of it falling over. WARNING 5ecurery support the vehicle

TIP vehicle on a center stand so that the place the vehicle on a center stand so that the place wheel is elevated.

Measure:

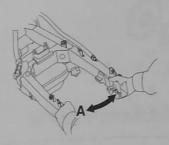
. Swingarm side play

Measure the tightening torque of the pivot shaft nut.

Pivot shaft nut 62 N·m (6.2 kgf·m, 46 lb·ft)

Measure the swingarm side play "A" by moving the swingarm from side to side.

If the swingarm side play is observed, check the thrust covers, bearings, and collar.

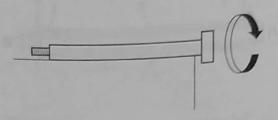


CHECKING THE SWINGARM

- 1. Check:
 - Swingarm Bends/cracks/damage → Replace.
- - · Pivot shaft Roll the pivot shaft on a flat surface. Bends → Replace.

A WARNING

Do not attempt to straighten a bent pivot



- 3. Wash:
 - · Pivot shaft
 - · Thrust covers
 - Collar
 - Bearings



Recommended cleaning solvent Kerosene

- 4. Check:
 - Thrust covers
 - Collar
 - Damage/wear → Replace.
 - Bearings Damage/pitting → Replace.

INSTALLING THE SWINGARM

- 1. Lubricate:
 - Bearings
 - Collar
 - · Thrust covers
 - · Pivot shaft



Recommended lubricant Lithium-soap-based grease

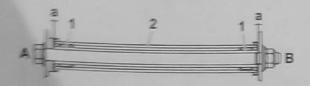
- 2. Install:
 - · Bearings "1"
 - Collar
 - Thrust covers
 - Seal guard
 - Chain



Bearing installed depth "a" 3.5-4.5 mm

TIP

Press mark of bearing must be towards out-



- 2 Swingarm
- A Left side
- B. Right side

3. Install:

Rear shock absorber assembly lower bott nut

TIP

Make sure that the swingarm swings smoothly without backlash after tightening pivot shaft.

4. Install

- Rear fender
 Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-58.
- Rear wheel
 Refer to "REAR SHOCK ABSORBER
 ASSEMBLY" on page 4-58 and "REAR
 WHEEL" on page 4-11.

5. Adjust:

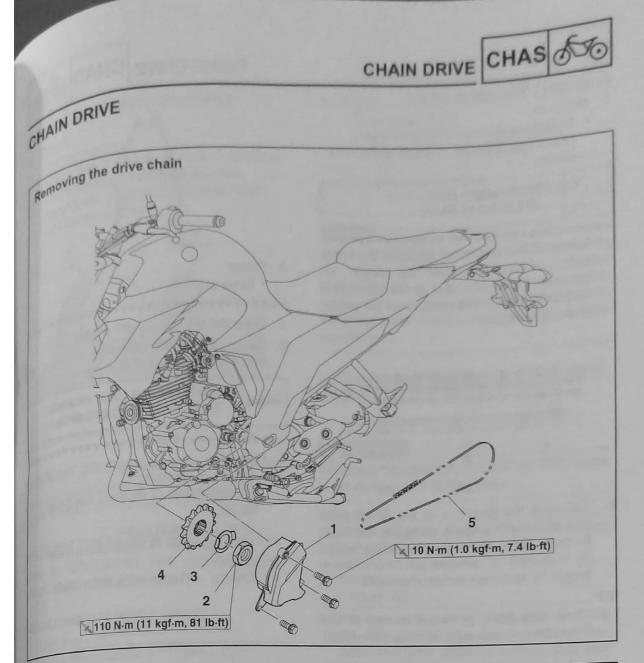
 Drive chain slack Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-17.



Drive chain slack 40.0-45.0 mm (1.57-1.77 in)

6. Install:

- Mud protector
- Chain protector



Ordor	Job/Parts to remove	Q'ty	Remarks
Order	Rear wheel		Refer to "REAR WHEEL" on page 4-11.
	Rear fender comp.		Refer to "REAR SHOCK ABSORBER ASSEMBLY" on page 4-58.
	Swingarm		Refer to "SWINGARM" on page 4-61.
1	Chain case cover	1	
2	Drive sprocket nut	1	
3	Lock washer	1	
4	Drive sprocket	1	Marine Ma
5	Drive chain	1	
		340	For installation, reverse the removal procedure.

^{*}Remove and install the drive chain sprocket by using special tool [Rotor holder tool - (YSST-S1113) (90890-01235)].

CHAIN DRIVE CHAS



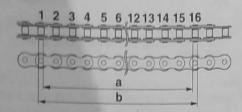
CHECKING THE DRIVE CHAIN

- 1. Measure:
 - 15-link section "a" of the drive chain
 Out of specification → Replace the drive chain.



15-link length limit 191.5 mm (7.54 in)

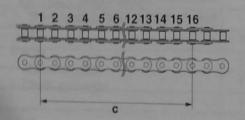
a. Measure the length "a" between the inner sides of the pins and the length "b" between the outer sides of the pins on a 15-link section of the drive chain as shown in the illustration.



b. Calculate the length "c" of the 15-link section of the drive chain using the following formula. Drive chain 15-link section length "c" = (length "a" between pin inner sides + length "b" between pin outer sides)/2

TIP

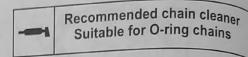
- When measuring a 15-link section of the drive chain, make sure that the drive chain is taut.
- Perform this procedure 2-3 times, at a different location each time.



- 2. Check:
 - Drive chain Stiffness → Clean and lubricate or replace.

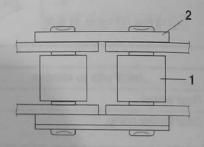


- 3. Check:
 - Drive chain
- a. Wipe the drive chain with a clean cloth
- b. Spray the chain cleaning chemical entire chain and clean it completely.

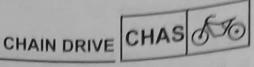


- 4. Check:
 - Drive chain rollers "1"
 Damage/wear → Replace the drive chain.
 - Drive chain side plates "2"
 Damage/wear → Replace the drive chain.

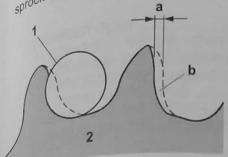
Cracks → Replace the drive chain.



- 5. Check:
 - Drive sprocket Refer to "REAR WHEEL" on page 4-11.



CHECKING THE DRIVE SPROCKET 1. Drive sprocket Drive sproons than 1/4 tooth "a" wear → Replace More that the chain sprockets as a set. the drive chain β ent teeth \rightarrow Replace the drive chain β ent as a set. sprockets as a set.



b. Correct prive chain roller

2 Drive chain sprocket

CHECKING THE REAR WHEEL SPROCKET

REPLACING THE REPLACING THE REAR WHEEL SPROCKET" on page 4-14.

CHECKING THE REAR WHEEL DRIVE HUB

Refer to "CHECKING THE REAR WHEEL ORIVE HUB" on page 4-14.

INSTALLING THE DRIVE CHAIN

1 Lubricate:

· Drive chain

2. Install:



Drive sprocket nut 110 N·m (11.0 kgf·m, 81 lb·ft)

3. Install:

· Swingarm Refer to "SWINGARM" on page 4-61.

When installing the rear arm on frame, make sure drive chain is installed first.

4 Install:

· Rear wheel Refer to "REAR WHEEL" on page 4-11.

5. Adjust:

Drive chain slack Refer to "ADJUSTING THE DRIVE CHAIN SLACK" on page 3-17.



Drive chain slack 40.0-45.0 mm (1.57-1.77 in)

NOTICE

A drive chain that is too tight will overload the engine and other vital parts, and one that is too loose can skip and damage the swingarm or cause an accident. Therefore, keep the drive chain slack within the specified limits.

CLEANING AND LUBRICATING THE DRIVE CHAIN

Stand the vehicle on a level surface.

MARNING

Securely support the vehicle so that there is no danger of it falling over.

TIP

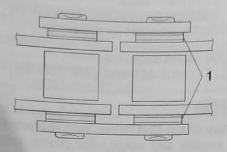
Place the vehicle on a center stand so that the rear wheel is elevated.

- 2. Clean:
 - · Drive chain
- a. Remove all deposits of dust, soil, mud, oil etc. during washing and dry it with air blow. Spray the chain cleaning solvent and wait 5 minutes to remove grease deposition.



- · Shake the cleaner well before use.
- · During washing of vehicle, never use kerosene, petrol or any other solvent for cleaning

b. Wipe the drive chain with a clean cloth.



NOTICE

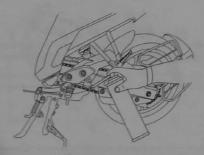
This motorcycle has a drive chain with small rubber O-rings "1" between the drive chain side plates. Never use high-pressure water or air, steam, gasoline, certain solvents (e.g., benzine), or a coarse brush to clean the drive chain. High-pressure methods could force dirt or water into the drive chain's internals, and solvents will deteriorate the O-rings. A coarse brush can also damage the O-rings. Therefore, use only chain cleaning solvent to clean the drive chain.

- 3. Lubricate:
 - · Drive chain



Recommended cleaner Yamalube chain cleaner Recommended lube Yamalube chain lube

a. Spray the lubricant inside the chain between inner/outer plates roller and bushes as shown in illustration.



- b. After spraying wait for 15 minutes.
- c. Wipe the drive chain with a clean cloth.

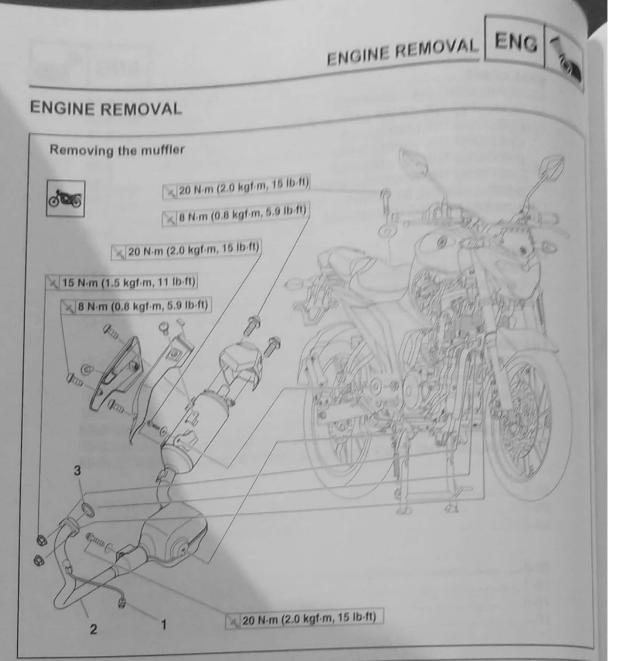
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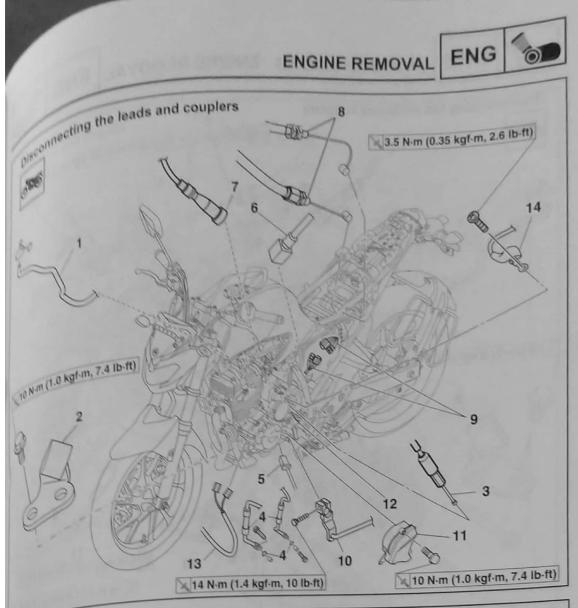


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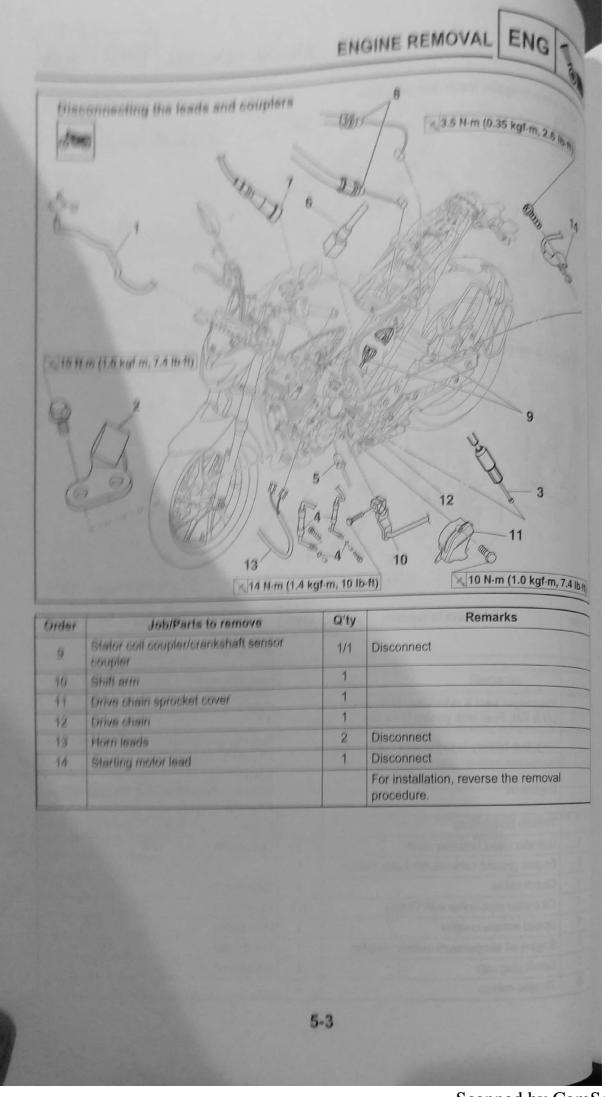


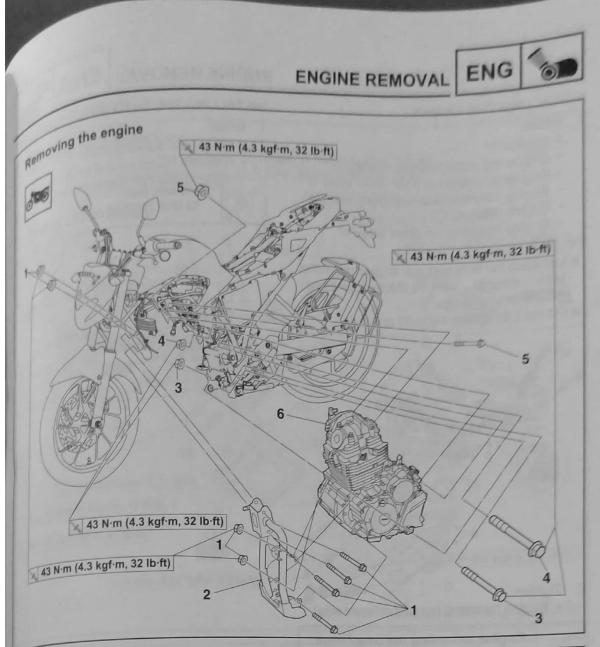
0-1	Job/Parts to remove	Q'ty	Remarks
Order		1	Disconnect
1	O ₂ sensor coupler		Disservices
2	Muffler	1	
3	Exhaust pipe gasket	1	
			For installation, reverse the removal procedure

While installing muffler, first tighten all bolts temporary then tighten cylinder head side bolts as per specified torque valve. Now, tighten remaining bolts as per specified torque value.



_	Job/Parts to remove	Q'ty	Remarks
Order			First, disconnect the negative battery lead, and then the positive battery lead.
-	Passenger seat & rider seat, Side covers LH & RH, Fuel tank panels LH & RH		Refer to "GENERAL CHASSIS" on page 4-1.
-	Negative battery lead/Positive battery lead		Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-62.
	Engine oil		Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-9.
	Throttle body/clamp	1	Loosen
1	Cylinder head breather hose	1	Disconnect
2	Engine ground cable/clutch cable holder	1	
3	Clutch cable	1	Disconnect
4	Oil cooler pipe/collar with O-ring	2/2	Disconnect
5	Speed sensor coupler	1	Disconnect
6	Engine oil temperature sensor coupler	1	Disconnect
7	Spark plug cap	1	Disconnect
8	Throttle cables	2	





Job/Parts to remo	ve Q'ty	Remarks
Engine mounting bracket bolt washer (Front side)	nut with 4/4	
Engine bracket	1	
Engine mounting bolt/nut (rea	r lower side) 1/1	
Engine mounting bolt/nut (rea		
Engine mounting bolt/nut (upp		
Engine	1	
Total Mariana		For installation, reverse the removal procedure.

ENGINE REMOVAL

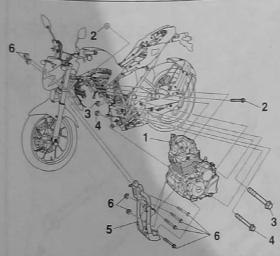
INSTALLING THE SHIFT ARM 1. Install:

· Drive chain sprocket cover

INSTALLING THE ENGINE

- 1. Install:
 - · Engine "1"
 - Engine mounting bolt (upper side) *2"
 - Engine mounting nut (rear upper side) "3"
 - Engine mounting bolt (rear lower side) "4"
 - · Engine bracket "5"
 - Engine mounting nut (front side) "6"

- Lubricate the front and rear engine mounting bolts threads with Lithium-soap-based grease or engine oil.
- Do not fully tighten the bolts and nuts.



2. Tighten:

· Engine mounting nut (upper/lower side)



Engine mounting nut (rear/lower upper side) 43 N·m (4.3 kgf·m, 32 lb·ft)

· Engine mounting nut (front side)



Engine mounting nut (front side) 43 N·m (4.3 kgf·m, 32 lb·ft)

Engine mounting nut (upper side)



Engine mounting nut (upper side) 43 N·m (4.3 kgf·m, 32 lb·ft)

Engine bracket nut (upper side)

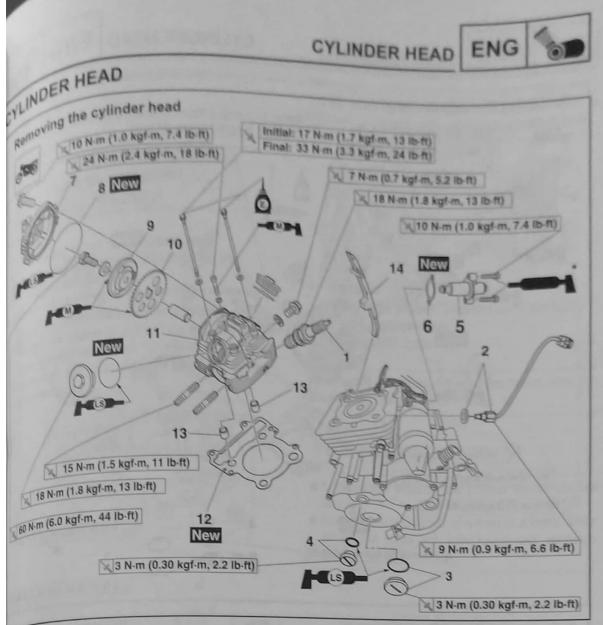


Engine bracket nut (upper side) 43 N·m (4.3 kgf·m, 32 lb·ft)



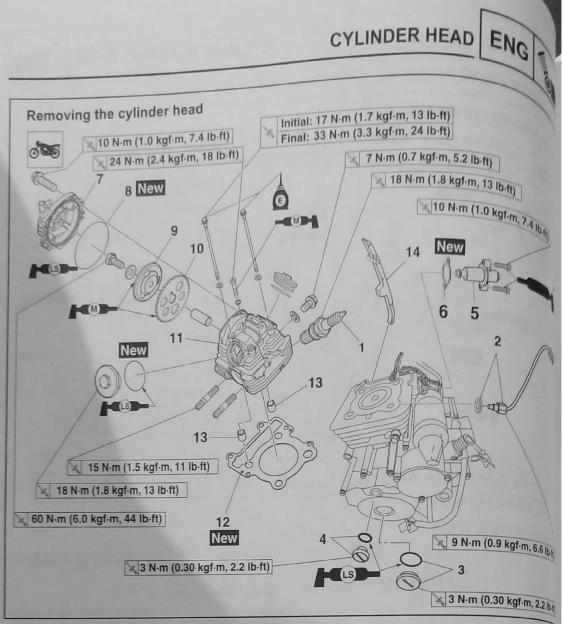
hift arm box 14 N·m (1.4 kgf·m, 32 , 10 lb/h Shift arm bolt





Order	Job/Parts to remove	Q'ty	Remarks
Uluci	Passenger & rider seat, left & right side cover		Refer to "GENERAL CHASSIS" on page 4-1.
_	Fuel tank panels LH & RH		Refer to "FUEL TANK" on page 6-1.
	Disconnecting the leads, hose and couplers		Disconnect Refer to "ENGINE REMOVAL" on page 5-2.
	Throttle body/clamp	-	Refer to "THROTTLE BODY" on page 6-5.
	Muffler		Refer to "ENGINE REMOVAL" on page 5-1.
1	Spark plug	1	
2	Engine oil temperature sensor with washer	1/1	
3	Crankshaft end accessing screw with O-ring	1/1	

Yamaha bond No. 1215B (Three Bond No. 1215B)



Order	Job/Parts to remove	Q'ty	Remarks
4	Timing mark accessing screw with O-ring	1/1	
5	Timing chain tensioner	1	
6	Timing chain tensioner gasket	1	
7	Camshaft sprocket cover	1	
8	Camshaft sprocket cover gasket O-ring	1	
9	Breather plate	1	
10	Camshaft sprocket	1	The second second
11	Cylinder head	1	
12	Cylinder head gasket	1	
13	Dowel pin	2	
14	Timing chain guide (exhaust side)	1	leading and area for short
			For installation, reverse the removal procedure.

^{*} Yamaha bond No. 1215B (Three Bond No. 1215B)

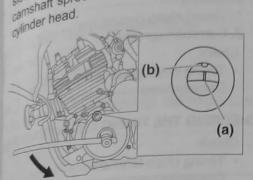
REMOVING THE CYLINDER HEAD gemove. Crankshaft end accessing screw and Cranksmark screw with their O-rings by iming special tool center plus timing many special tool center plug spanner using a special tool center plug spanner.

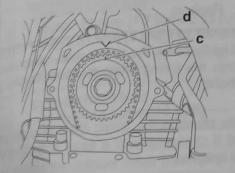
Center plug spanner

YSST-625

lign:
"I" mark "a" on the magneto rotor with the stationary pointer "b" on the magneto cover)

Turn the crankshaft counterclockwise. Tun the piston is at TDC on the compres-When the place of the compression stroke, align the "I" mark "c" on the sion stroke, mark con the camshaft sprocket with the mark "d" on the



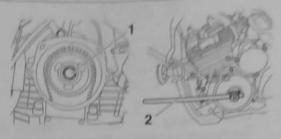


3. Loosen:

· Camshaft sprocket bolt "1"

TIP

While holding the magneto rotor bolt with a wrench "2", loosen the camshaft sprocket bolt.



- Breather plate, Camshaft sprocket bolt along with washer
- Camshaft sprocket

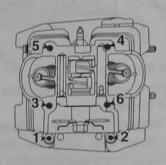
TIP

To prevent the timing chain from falling into the crankcase, fasten it with a wire.

5. Remove:

· Cylinder head

- Loosen the bolts in the proper sequence as shown.
- Loosen each bolt 1/2 of a turn at a time. After all of the bolts are fully loosened, remove



CHECKING THE CYLINDER HEAD

1. Eliminate:

 Combustion chamber carbon deposits (with a rounded scraper)

TIP

Do not use a sharp instrument to avoid damaging or scratching:

- Spark plug bore threads
- Valve seats

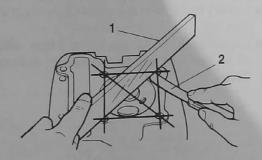


- 2. Check:
 - Cylinder head
 Damage/scratches → Replace.
- 3. Measure:
 - Cylinder head warpage
 Out of specification → Resurface the
 cylinder head.



Warpage limit 0.05 mm

a. Place a straightedge "1" and a thickness gauge "2" across the cylinder head.



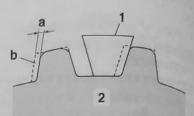
- b. Measure the warpage.
- If the limit is exceeded, resurface the cylinder head as follows.
- d. Place a 400–600 grit wet sandpaper on the surface plate and resurface the cylinder head using a figure-eight sanding pattern.

TIP

To ensure an even surface, rotate the cylinder head several times.

CHECKING THE CAMSHAFT SPROCKED

- 1. Check:
 - Camshaft sprocket
 More than 1/4 tooth wear "a" → Replace the camshaft sprocket, timing chain and crankshaft sprocket as a set.



- a. 1/4 tooth
- b. Correct
- 1. Timing chain contact link
- 2. Camshaft sprocket
- 2. Check:
 - Timing chain guide (exhaust side)
 Damage/wear → Replace.

CHECKING THE TIMING CHAIN TENSIONER

- 1. Check:
 - Timing chain tensioner
 Cracks/damage/rough movement →
 Replace.
- Lightly press the timing chain tensioner rod into the timing chain tensioner housing by hand.

~~~~~~~~~~~~~~~~

TIP

While pressing the timing chain tensioner rod, wind it clockwise with a small screwdriver "1" until it stops.

b. Remove the screwdriver and slowly release the timing chain tensioner rod.

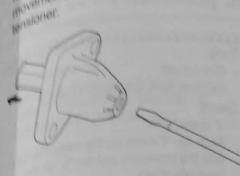








Make gure that the timing chain tensioner New sure out of the timing chain tensioner of the sure smoothly. If there red comes amouthly. If there is rough movement, replace the timing chain



Small screw driver YSST-609

## INSTALLING THE CYLINDER HEAD

1. Install:

. Cylinder head

The timing chain through the timing chain cavity.

2. Tighten:

· Cylinder head bolts "1"



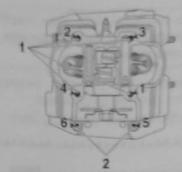
Cylinder head bolt Initial: 17 N·m (1.7 kgf·m, 13 lb·ft) Final: 33 N·m (3.3 kgf·m, 24 lb·ft)

· Cylinder head bolts "2"



Cylinder head bolt 24 N·m (2.4 kgf·m, 18 lb·ft)

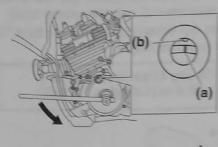
- Lubricate the cylinder head bolts (5-6) with molybdenum disulphide grease.
- Lubricate the cylinder head bolts (1-4) with
- Tighten the cylinder head bolts in the proper tightening sequence as shown and torque them in two stages.



3. Install:

· Camshaft sprocket

- Turn the crankshaft counterclockwise
- b. Align the "I" mark "a" on the magneto rotor with the stationary pointer "b" on the magneto cover.
- c. Align the "I" mark "c" on the camshaft sprocket with the stationary pointer "d" on the cylinder head.
- d. Install the timing chain onto the camshaft sprocket, and then install the camshaft sprocket onto the camshaft and then install the camshaft sprocket bolt with washer.





When installing the camshaft sprocket, be sure to keep the timing chain as tight as possible on the exhaust side.

## CYLINDER HEAD

d. Remove the screwdriver, make sure chain tensioner rod releases ing chain tensioner rod releases

NOTICE

Do not turn the crankshaft when installing the camshaft(s) to avoid damage or improper valve timing.

- While holding the camshaft, temporarily tighten the camshaft sprocket bolt.
- Remove the wire from the timing chain.

\*\*\*\*\*

- 4. Install:
  - Timing chain tensioner gasket New
  - · Timing chain tensioner

a. Apply sealant to the timing chain tensioner bolt threads.

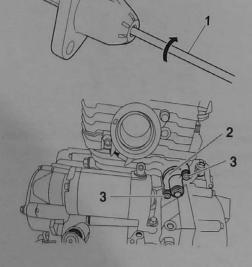


Yamaha bond No. 1215B (Three Bond No.1215B®)

- b. While lightly pressing the timing chain tensioner rod by hand, turn the tensioner rod fully clockwise with a small screwdriver "1".
- c. With the timing chain tensioner rod turned all the way into the timing chain tensioner housing (with the small screwdriver still installed), install the gasket and the timing chain tensioner "2" onto the cylinder block.
- d. Tighten the timing chain tensioner bolts "3" to the specified torque.



Timing chain tensioner bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

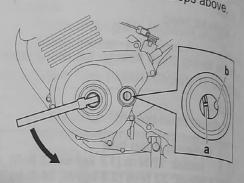


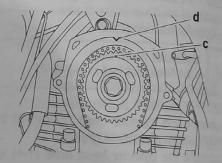
Small screw driver YSST-609

AAAAAAA

5. Turn:

- · Crankshaft (several turns counterclockwise)
- 6. Check:
  - · "I" mark "a" "I" mark a Align the "I" mark on the magneto role to ctationary pointer "b" on the ctationary pointer "b" of the ctationary pointer "b" of the ctationary pointer "b" of the ctationary pointer "b" on the ctationary pointer "b" of the ctationary pointer "b" of the with the stationary pointer "b" on the
  - · "I" mark "c" Align the "I" mark on the camshaft sprocket with the stationary pointer of the Out of alignment → Correct. Refer to the installation steps above





7. Tighten:

· Camshaft sprocket bolt

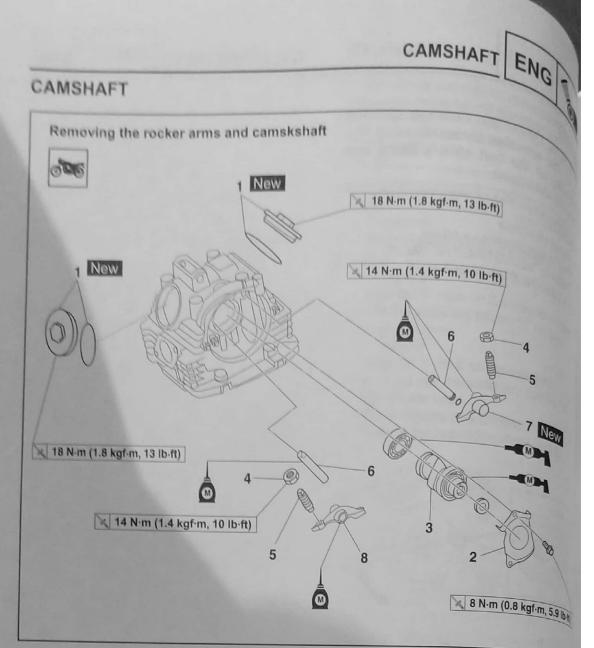


Camshaft sprocket bolt 60 N·m (6.0 kgf·m, 44 lb·ft) CYLINDER HEAD ENG

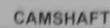


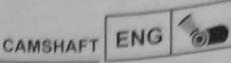
ge sure to tighten the camshaft sprocket se sure to specified torque to avoid the specific to the bolt coming loose and specific to the bolt coming loose and specific to the specific to the specific to the specific to the specific to tighten the camshaft sprocket and specific to tighten the camshaft sprocket specific to the sp

Measure: , Valve clearance Valve clearance
 Out of specification → Adjust.
 Refer to "ADJUSTING THE VALVE CLEARANCE" on page 3-4.



| Order | Job/Parts to remove     | Q'ty | Remarks                                          |
|-------|-------------------------|------|--------------------------------------------------|
|       | Cylinder head           |      | Refer to "CYLINDER HEAD" on page                 |
| 1     | Valve cover with O-ring | 2/2  | off page                                         |
| 2     | Camshaft plate          | 1    |                                                  |
| 3     | Camshaft                | 1    |                                                  |
| 4     | Locknut                 | 2    |                                                  |
| 5     | Adjusting screw         | 2    |                                                  |
| 6     | Rocker arm shaft        | 2    |                                                  |
| 7     | Intake rocker arm       | 1    |                                                  |
| 8     | Exhaust rocker arm      | 1    |                                                  |
|       |                         |      | For installation, reverse the removal procedure. |





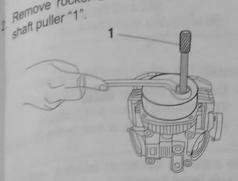
# REMOVING THE ROCKER ARMS AND

CAMSHAFT

Loosen: , Lockhut , Valve clearance adjusting screw "2"



Remove rocker arm shaft with rocker arm

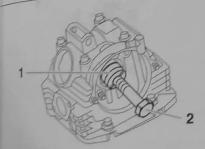


Rocker arm shaft puller YSST-1208

Remove:

. Camshaft "1"

Salew 10 mm bolt "2" into the threaded end of the camshaft and then pull out the camshaft.



### CHECKING THE CAMSHAFT

### 1. Check:

· Camshaft lobes Blue discoloration/pitting/scratches → Replace the camshaft.

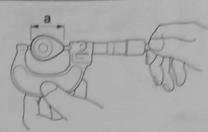
### 2. Measure:

 Camshaft lobe dimensions "a" and "b" Out of specification -> Replace the camshaft.



Camshaft lobe dimensions Intake "a" 36.890-36.990 mm Limit 36.790 mm Exhaust "a" 36.890-36.990 mm Limit

36.790 mm



### 3. Check:

· Camshaft oil passage Obstruction → Blow out with compressed air.

### CHECKING THE ROCKER ARMS AND ROCKER ARM SHAFTS

The following procedure applies to all of the rocker arms and rocker arm shafts.

### 1. Check:

 Rocker arm Damage/wear → Replace.

### 2. Check:

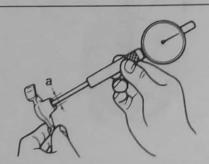
· Rocker arm shaft Blue discoloration/excessive wear/pitting/ scratches → Replace or check the lubrication system.

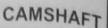
### 3. Measure:

· Rocker arm inside diameter "a" Out of specification → Replace.



Rocker arm inside diameter 12.000-12.018 mm Limit 12.033 mm





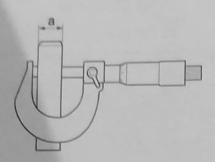


### 4. Measure:

· Rocker arm shaft outside diameter "a" Out of specification → Replace.



Rocker arm shaft outside diameter 11.981-11.991 mm Limit 11.950 mm



### 5. Calculate:

· Rocker-arm-to-rocker-arm-shaft clearance

### TIP

Calculate the clearance by subtracting the rocker arm shaft outside diameter from the rocker arm inside diameter.

> Out of specification → Replace the defective part(s).

### REMOVING AND INSTALLING THE **CAMSHAFT BEARING**

### 1. Remove:

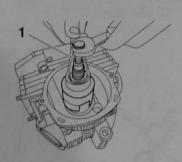
· Camshaft bearing with bearing puller "1" as shown in the illustration.



**Bearing Puller** YSST-824



Cup-C YSST-620-C



Make sure the bearing puller is cent

### 2. Check:

- Check:

  Clean and lubricate the bearings to the inner race with finger to rotate the inner race with finger Rough movement → Replace
- Damage/Wear → Replace



### 3. Install:

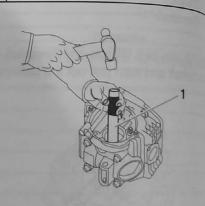
· Camshaft Bearing New With bearing punch and suitable attachment "1" as shown in the illustra

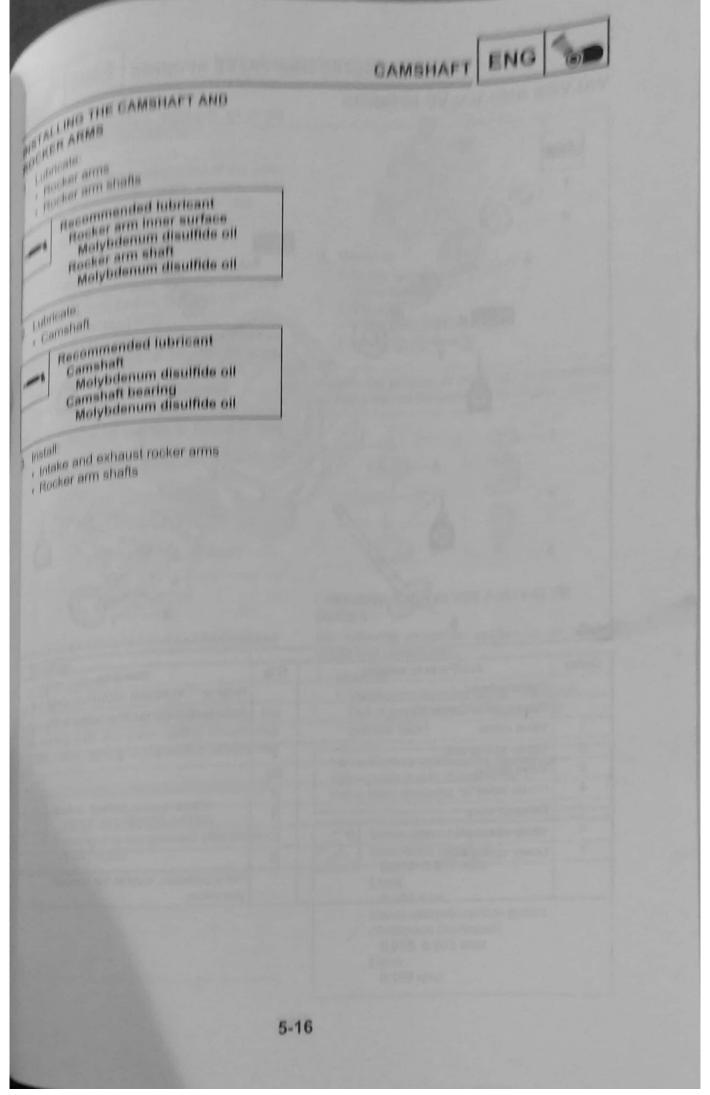
### TIP

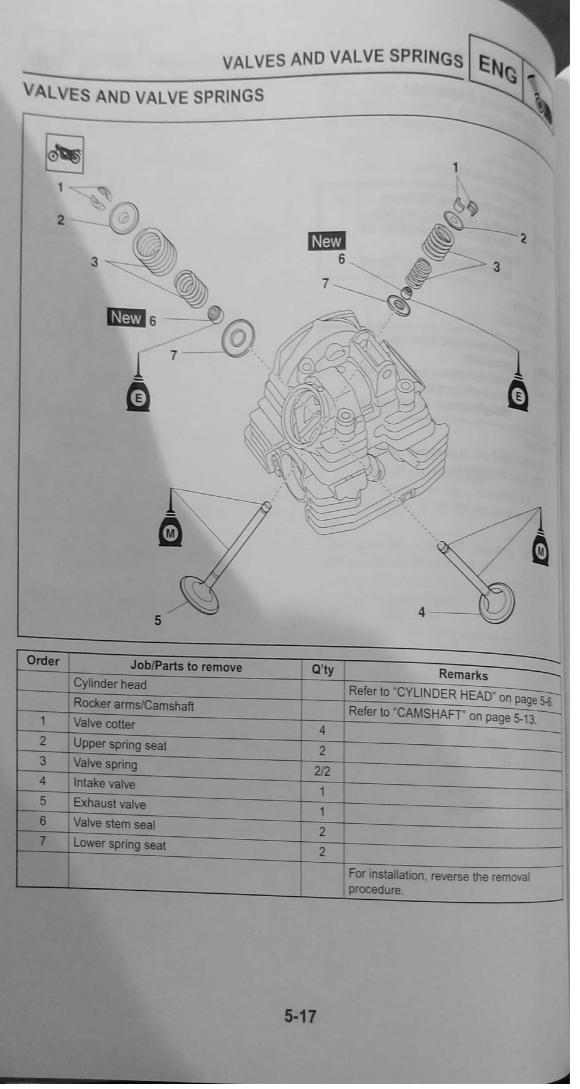
While installing camshaft bearing, make seal side faces towards outside.



**Bearing Punch YSST-951** 











REMOVING THE VALVES The following procedure applies to all of the The sand related components.

pefore removing the internal parts of the cylinbelove head (e.g., valves, valve springs, valve der news springs, v seals), make sure the valves properly seal.

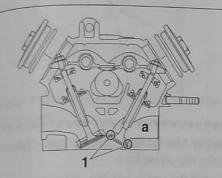
## Check:

. Valve sealing Leakage at the valve seat → Check the valve face, valve seat, and valve seat width. Refer to "CHECKING THE VALVE SEATS" on page 5-19.

Pour a clean solvent "a" into the intake and exhaust ports.

Check that the valves properly seal.

There should be no leakage at the valve seat 4".



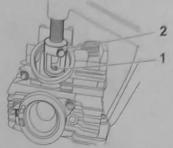
### 2. Remove:

· Valve cotters "1"

Remove the valve cotters by compressing the valve spring with the valve spring compressor and the valve spring compressor attachment "2".



Valve spring compressor YSST-603 (90890-04109) Valve spring compressor attachment YSST-1203

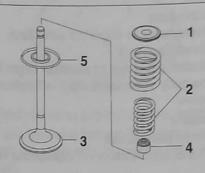


### 3. Remove:

- · Upper spring seat "1"
- Valve springs "2"
- Valve "3"
- Valve stem seal "4"
- Lower spring seat "5"

### TIP

Identify the position of each part very carefully so that it can be reinstalled in its original place.



### CHECKING THE VALVES AND VALVE **GUIDES**

The following procedure applies to all of the valves and valve guides.

### 1. Measure:

- Valve-stem-to-valve-guide clearance Out of specification → Replace the cylinder head
- Valve-stem-to-valve-guide clearance = Valve guide inside diameter "a" -Valve stem diameter "b".



Valve-stem-to-valve-guide clearance (intake) 0.010-0.037 mm Limit 0.080 mm Valve-stem-to-valve-guide clearance (exhaust) 0.025-0.052 mm Limit 0.100 mm

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## CHECKING THE VALVE SEATS The following procedure applies to all

valves and valve seats. 1. Eliminate:

· Carbon deposits (from the valve face and valve Seat)

2. Check:

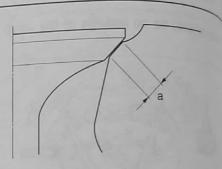
 Valve seat Pitting/wear → Replace the cylinder h

3. Measure:

 Valve seat width C "a" Out of specification → Replace the cylinder head.

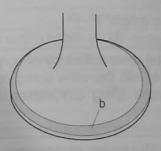


Valve seat width C (intake) 0.90-1.20 mm Valve seat width C (exhaust) 0.90-1.20 mm



a. Apply Mechanic's blueing dye (Dykem) onto the valve face.

b. Install the valve into the cylinder head



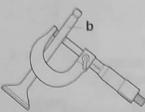
- c. Press the valve through the valve guide and onto the valve seat to make a clear impression.
- d. Measure the valve seat width.

Where the valve seat and valve face contacted one another, the blueing will have been removed.

\*\*\*\*\*\*\*







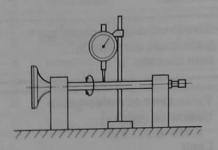
Valve & Valve guide clearance = a-b

- 2. Eliminate:
  - · Carbon deposits (from the valve face and valve seat)
- 3. Check:
  - · Valve face Pitting/wear → Grind the valve face.
  - · Valve stem end Mushroom shape or diameter larger than the body of the valve stem  $\rightarrow$  Replace the valve.
- 4. Measure:
  - · Valve stem runout Out of specification  $\rightarrow$  Replace the valve.

- When installing a new valve, always replace the valve guide.
- If the valve is removed or replaced, always replace the valve stem seal.



Valve stem runout 0.010 mm







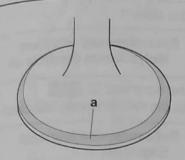
Lap.

. Valve face . Valve seat

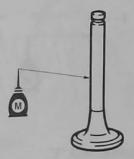
After replacing the cylinder head or replacing After replacing need or replacing the valve and valve guide, the valve seat and the face should be lapped.

Apply a coarse lapping compound "a" to the valve face.

NOTICE not let the lapping compound enter the po between the valve stem and the valve guide.

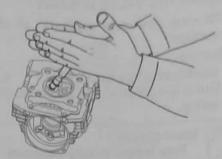


b. Apply molybdenum disulfide oil onto the valve stem.

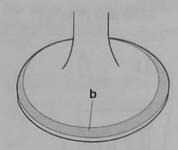


- c. Install the valve into the cylinder head.
- d. Turn the valve until the valve face and valve seat are evenly polished, then clean off all of the lapping compound.

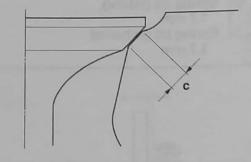
For the best lapping results, lightly tap the valve seat while rotating the valve back and forth between your hands.



- e. Apply a fine lapping compound to the valve face and repeat the above steps.
- f. After every lapping procedure, be sure to clean off all of the lapping compound from the valve face and valve seat.



- g. Install the valve into the cylinder head.
- h. Press the valve through the valve guide and onto the valve seat to make a clear impres-
- i. Measure the valve seat width "c" again. If the valve seat width is out of specification, reface and lap the valve seat.



## ENG

## CHECKING THE VALVE SPRINGS

The following procedure applies to all of the valve springs.

### 1. Measure:

· Valve spring free length "a" Out of specification → Replace the valve spring.



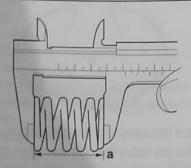
Inner spring Free length (intake/exhaust) 36.17 mm (1.42 in)

34.36 mm (1.35 in) Outer spring

Free length (intake/exhaust) 36.63 mm (1.44 in)

Limit

34.80 mm (1.37 in)

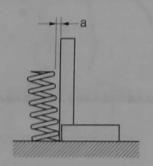


### 2. Measure:

· Valve spring tilt "a" Out of specification → Replace the valve spring.



Spring tilt (intake) 1.7 mm Spring tilt (exhaust) 1.7 mm

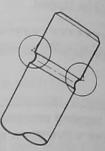


## INSTALLING THE VALVES

The following procedure applies to all of the pand related components.

### 1. Deburr:

· Valve stem end (with an oil stone)



### 2. Lubricate:

· Valve stem "1"

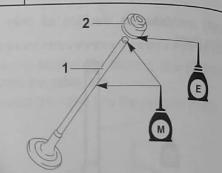


Recommended lubricant Molybdenum disulfide oil

 Valve stem seal "2" New (with the recommended lubricant)



Recommended lubricant Engine oil

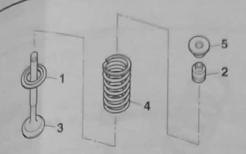


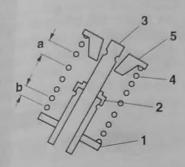
### 3. Install:

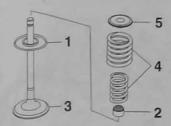
- · Lower spring seat "1"
- Valve stem seal "2" New
- · Valve "3"
- · Valve springs "4"
- · Upper spring seat "5" (into the cylinder head)

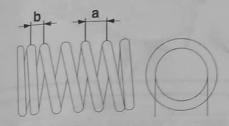
- Make sure each valve is installed in its original. nal place.
- Install the valve springs with the larger pitch "a" facing up and grey point on open patch side.











- b. Smaller pitch
- 4. Install:
  - · Valve cotters "1"

Install the valve cotters by compressing the valve spring with the valve spring compressor "2".



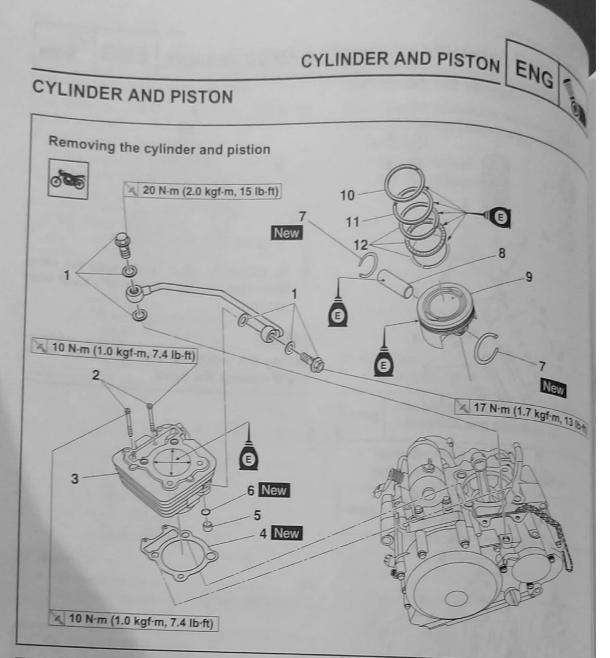
Valve spring compressor YSST-603 (90890-04109) Valve spring compressor attachment YSST-1203



 To secure the valve cotters onto the valve stem, lightly tap the valve tip with a soft-face hammer.

### NOTICE

Hitting the valve tip with excessive force could damage the valve.



| Order | Job/Parts to remove                        | Q'ty | D .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|-------|--------------------------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | Cylinder head                              | ٠.,  | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 1     | Engine oil pressure pipe bolt with washers | 2/4  | Refer to "CYLINDER HEAD" on page                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 2     | Cylinder bolts                             | 2    | ATT NO                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| 3     | Cylinder                                   | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4     | Cylinder gasket                            | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 5     | Dowel pin                                  | 2    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 6     | Dowel pin O-ring                           | 1    | TO THE STATE OF THE PARTY OF THE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| 7     | Piston pin clip                            | 2    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 8     | Piston pin                                 | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 9     | Piston                                     | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 10    | Top ring                                   | 1    | The state of the s |
| 11    | 2nd ring                                   | 1    | The state of the s |
| 12    | Oil ring                                   | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|       |                                            | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|       |                                            |      | For installation, reverse the removal procedure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## CYLINDER AND PISTON





# REMOVING THE PISTON

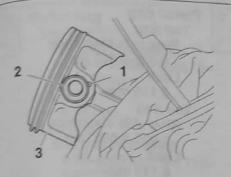
Remove:

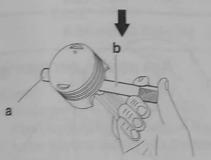
- . Piston pin clips "1"
- . Piston pin "2"
- , Piston "3"

NOTICE

not use a hammer to drive the piston an out.

- Before removing the piston pin clip, cover the crankcase opening with a clean rag to prevent the piston pin clip from falling into the crankcase.
- Before removing the piston pin, deburr the piston pin clip's groove and the piston pin hare area.
- Remove the piston pin "a" by pressing the piston pin replacer "b".







Piston pin replacer YSST-207

### 2. Remove:

- · Top ring
- · 2nd ring
- Oil ring

TIP

When removing a piston ring, open the end gap with your fingers and lift the other side of the ring over the piston crown.

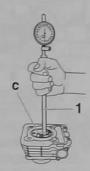


## CHECKING THE CYLINDER AND PISTON

- 1. Check:
  - · Piston wall
  - Cylinder wall
     Vertical scratches → Replace the
     cylinder, and replace the piston and piston
     rings as a set.
- 2. Measure:
  - Piston-to-cylinder clearance

\*\*\*\*\*\*

a. Measure cylinder bore "C" with the cylinder bore gauge "1".



TIP

Measure cylinder bore "C" by taking side-toside and front-to-back measurements of the cylinder. Then, find the average of the measurements.



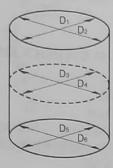
Bore 74.000-74.016 mm

ENG

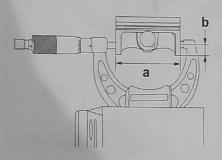
Cylinder bore "C" = maximum of Diameter

Taper limit "T" = maximum of  $D_1$  or  $D_2$  maximum of D<sub>5</sub> or D<sub>6</sub>

Out of round limit "R" = maximum of  $D_1$ ,  $D_3$  or  $\mathsf{D}_5$  - minimum of  $\mathsf{D}_2,\,\mathsf{D}_4$  or  $\mathsf{D}_6$ 



- b. If out of specification, replace the cylinder, and replace the piston and piston rings as a set.
- c. Measure piston skirt diameter "D" "a" with the micrometer.



b. 5.0 mm (0.20 in) from the bottom edge of the



### **Piston** Diameter D 73.983-73.998 mm

- d. If out of specification, replace the piston and piston rings as a set.
- e. Calculate the piston-to-cylinder clearance with the following formula.
- Piston-to-cylinder clearance = Cylinder bore "C" -Piston skirt diameter "D"



Piston-to-cylinder clearance 0.010-0.025 mm Limit 0.15 mm

If out of specification, replace the cylinder the piston and piston rings If out of specification and piston rings as

## \*\*\*\* CHECKING THE PISTON RINGS

- 1. Measure:
  - · Piston ring side clearance Out of specification → Replace the piston and piston rings as a set.

TIP -

Before measuring the piston ring side clear ance, eliminate any carbon deposits from piston ring grooves and piston rings.



Piston ring Top ring Ring side clearance 0.030-0.065 mm Limit 0.115 mm 2nd ring Ring side clearance 0.020-0.055 mm Limit 0.115 mm



- 2. Install:
  - · Piston ring (into the cylinder)

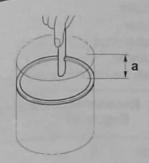
TIP

Level the piston ring into the cylinder with the piston crown.

## CYLINDER AND PISTON







a. 40 mm

Measure: . Piston ring end gap

Out of specification → Replace the piston ring.

The oil ring expander spacer end gap cannot be The oil ring rail gap is excessive, measure all three piston rings.



Piston ring Top ring

End gap (installed) 0.19-0.31 mm (0.0075-

0.0122 in)

Limit

0.56 mm

2nd ring

End gap (installed)

0.30-0.45 mm (0.0118-

0.0177 in)

Limit

0.80 mm (0.0314 in)

## CHECKING THE PISTON PIN

### 1. Check:

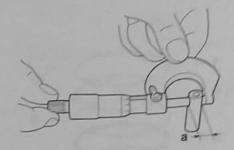
· Piston pin Blue discoloration/grooves → Replace the piston pin and then check the lubrication system.

### 2. Measure:

· Piston pin outside diameter "a" Out of specification -> Replace the piston pin.



Piston pin outside diameter 16.991-17.000 mm (0.6689-0.6693 in) Limit 16.980 mm



### Measure:

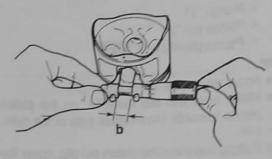
 Piston pin bore diameter "b" Out of specification → Replace the piston.



Piston pin bore inside diameter 17.002-17.013 mm (0.6694-0.6698 in)

Limit

17.043 mm



### 4. Calculate:

- Piston-pin-to-piston-pin-bore clearance Out of specification → Replace the piston pin and piston as a set.
- Piston-pin-to-piston-pin-bore clearance = Piston pin bore diameter "b" -Piston pin outside diameter "a"

### INSTALLING THE PISTON AND CYLINDER

### 1. Install:

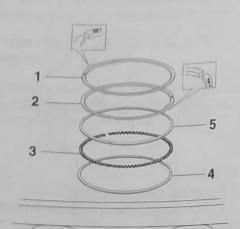
- · Top ring "1"
- · 2nd ring "2"
- · Oil ring expander "3"
- Lower oil ring rail "4"
- Upper oil ring rail "5"

### TIP.

- · Be sure to install the piston rings so that the manufacturer marks or numbers face up.
- · Be sure to install oil expander "6" so that the cut ends are as shown.
- . To install oil ring, install the expander first then install the oil ring rails.

## CYLINDER AND PISTON

ENG





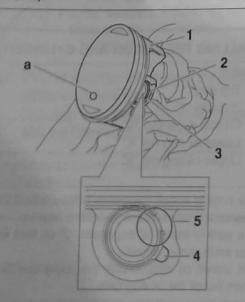
- · Piston "1"
- · Piston pin "2"
- Piston pin clips "3" New

### TIP

- Apply engine oil to the piston pin.
- · Make sure the dot mark "a" on the piston points towards the exhaust side of the cylinder.
- Before installing the piston pin clip, cover the crankcase opening with a clean rag to prevent the clip from falling into the crankcase.

### TIP

When installing the circlips, the circlip installing groove "4" and the circlip slit "5" should not overlap.

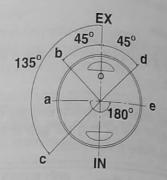


- 3. Lubricate:
  - Piston
  - Piston rings
  - Cylinder

(with the recommended lubricant) Recommended lubricant Engine oil

### Offset:

· Piston ring end gaps



- a. Top ring
- b. Oil ring expander
- c. Upper oil ring rail
- d. Lower oil ring rail
- e. 2nd ring
- A. exhaust side

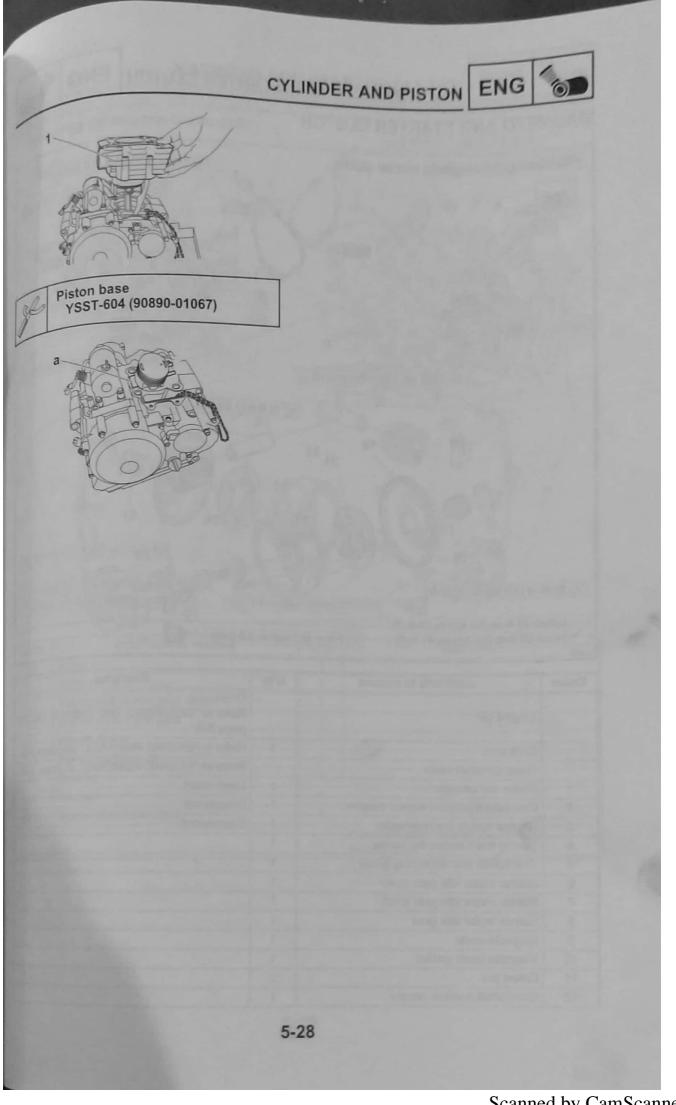
- After installing the rings, make sure the rings can be rotated freely.
- After installing the rings, apply engine oil in the entire circumference of piston.

### 5. Install:

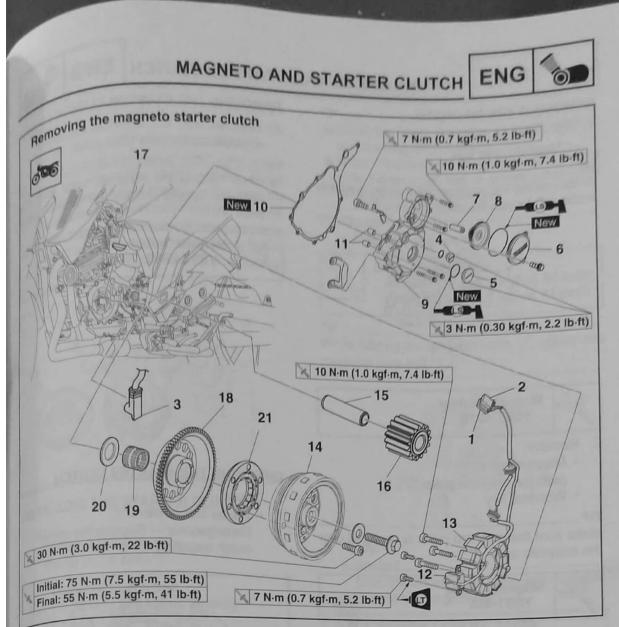
- · O-ring
- · Dowel pins
- · Cylinder head gasket New
- · Cylinder "1"

### TIP

- Use piston base "a" as shown to install the piston.
- While compressing the piston rings with one hand, install the cylinder with the other hand so that oil rings and oil rails should not come
- Pass the timing chain and timing chain guide (intake side) through the timing chain cavity.

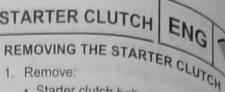






| Order | Job/Parts to remove            | Q'ty | Remarks                                          |
|-------|--------------------------------|------|--------------------------------------------------|
| 13    | Stator coil                    | 1    |                                                  |
| 14    | Magneto rotor                  | 1    |                                                  |
| 15    | Starter clutch idle gear shaft | 1    |                                                  |
| 16    | Starter clutch idle gear       | 1    |                                                  |
| 17    | Woodruff key                   | 1    |                                                  |
| 18    | Starter clutch gear            | 1    |                                                  |
| 19    | Bearing                        | 1    |                                                  |
| 20    | Washer                         | 1    |                                                  |
| 21    | Starter clutch assembly        | 1    |                                                  |
|       |                                |      | For installation, reverse the removal procedure. |

## MAGNETO AND STARTER CLUTCH



## REMOVING THE MAGNETO

- 1. Remove:
  - Magneto rotor bolt

### TIP

While holding the magneto rotor using magneto holder "1", loosen the magneto rotor bolt.





### Magneto Holder YSST-601B

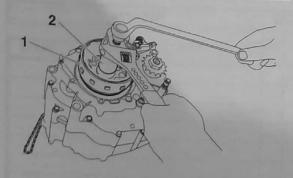
- Remove:
  - Magneto rotor "1" (with the magneto puller "2")
  - Woodruff key

### TIP

Make sure the magneto puller is centered over the magneto rotor.



### Magneto puller YSST-628



· Starter clutch bolts "1"

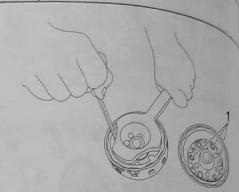
### TIP

While holding the magneto rotor

who was to holder, remove the Starter While holding under the starter of t

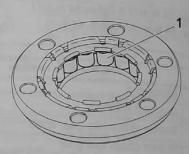


### Magneto holder YSST-601B



## CHECKING THE STARTER CLUTCH

- 1. Check:
  - · Starter clutch rollers "1" Damage/wear → Replace the starter clutch assembly.



### 2. Check:

- · Starter clutch idle gear
- · Starter clutch gear  $Burrs/chips/roughness/wear \rightarrow Replace$ the defective part(s).
- 3. Check:
  - Starter clutch gear contacting surfaces  ${\tt Damage/pitting/wear} \rightarrow {\tt Replace} \ {\tt the}$ starter clutch gear.
- 4. Check:
  - Starter clutch operation

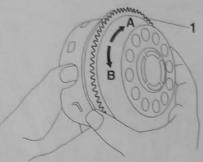
# MAGNETO AND STARTER CLUTCH





Install the starter clutch gear "1" onto the Install the starter clutch and hold the magneto rotor.

when turning the starter clutch gear clock-When the starter clutch and the starter wise gear should engage, otherwise the starter clutch is faulty and must be replaced. when turning the starter clutch gear coun-When turns "B", it should turn freely, otherterclock starter clutch is faulty and must be replaced.



## AAAAAAAAAAAAAAAAA INSTALLING THE STARTER CLUTCH

- . Starter clutch assembly
- . Starter clutch bolts "1"



Starter clutch bolt 30 N·m (3.0 kgf·m, 22 lb·ft) LOCTITE®

While holding the magneto rotor, tighten the starter clutch bolts "1".



### INSTALLING THE MAGNETO

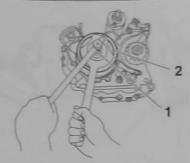
- 1. Install:
  - · Woodruff key
  - · Magneto rotor
  - · Magneto rotor nut

- · Clean the tapered portion of the crankshaft and the magneto rotor hub.
- When installing the magneto rotor, make sure the woodruff key is properly sealed in the keyway of the crankshaft.
- 2. Tighten:
  - Magneto rotor bolt "1"



Magneto rotor bolt Initial: 75 N·m (7.5 kgf·m, 55 lb-ft) Final: 55 N·m (5.5 kgf·m, 41 lb-ft)

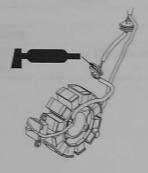
While holding the magneto rotor "2", tighten the magneto rotor bolt "1".



- 3. Apply:
  - · Sealant (onto the crankshaft position sensor/stator assembly lead grommet)



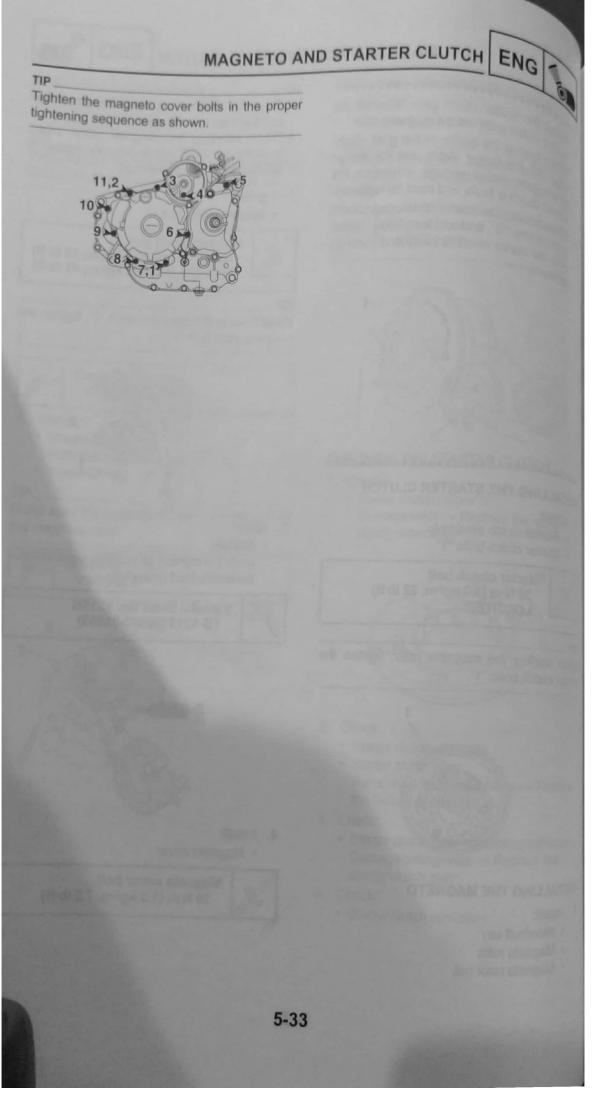
Yamaha bond No. 1215B TB-1215 (90890-85505)

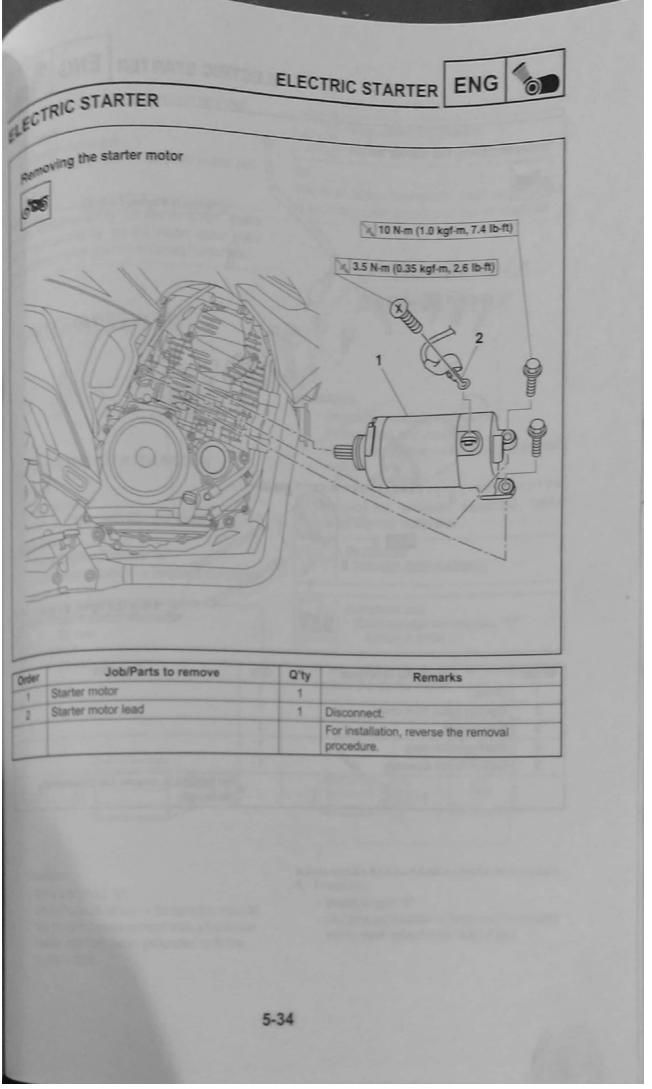


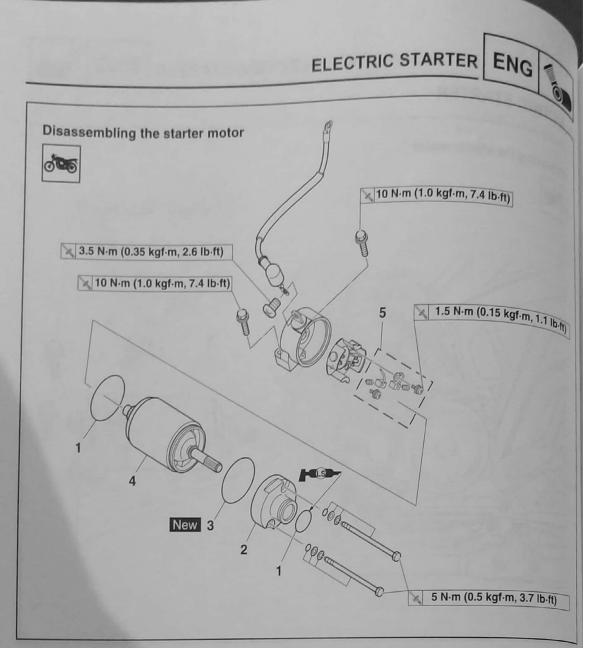
- 4. Install:
  - · Magneto cover



Magneto cover bolt 10 N·m (1.0 kgf·m, 7.2 lb·ft)







| Order | Job/Parts to remove        | Q'ty | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------|----------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | O-ring                     | 1    | The state of the s |
| 2     | Starting motor front cover | 1    | (tear stom years)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 3     | Yoke gasket                | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4     | Starting motor assy.       | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 5     | Carbon brush assembly      | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|       |                            |      | For assembly, reverse the disassembly procedure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

## ELECTRIC STARTER



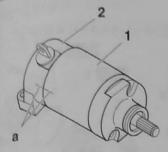


# DISASSEMBLING THE STARTER MOTOR

Remove.

Remover motor yoke "1" , Starter motor rear cover/brush holder set

if disassembling the starter motor, make felore marks "a" on the starter motor gefore disassembling the starter motor, make alignment marks "a" on the starter motor yoke alignment motor rear cover/brush holder and starter motor rear cover/brush holder set.



# CHECKING THE STARTER MOTOR

1. Check:

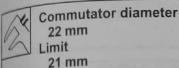
. Commutator

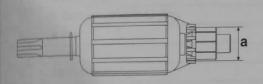
pirt → Clean with 600 grit sandpaper.

2. Measure:

. Commutator diameter "a"

Out of specification → Replace the starter motor.





### 3. Measure:

· Mica undercut "a" Out of specification → Scrape the mica to the proper measurement with a hacksaw blade that has been grounded to fit the commutator.



Mica undercut (depth) 1.5 mm

TIP

The mica of the commutator must be undercut to ensure proper operation of the commutator



### 4. Measure:

· Armature assembly resistances (commutator and insulation) Out of specification → Replace the starter motor.

a. Measure the armature assembly resistances with the multimeter.

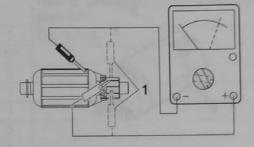


Multimeter INS-003 (90890-03243)



Armature coil Commutator resistance "1"  $0.0126-0.0154 \Omega$ 

b. If any resistance is out of specification, replace the starter motor.

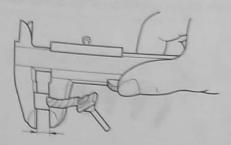


### 5. Measure:

· Brush length "a" Out of specification → Replace the starter motor front cover/brush holder set.

\_\_\_\_\_





### 6. Check:

Gear teeth
 Damage/wear → Replace the gear.

## 7. Check:

- · Bearing
- Oil seal
   Damage/wear → Replace the starter motor front cover/brush holder set.

## ASSEMBLING THE STARTER MOTOR

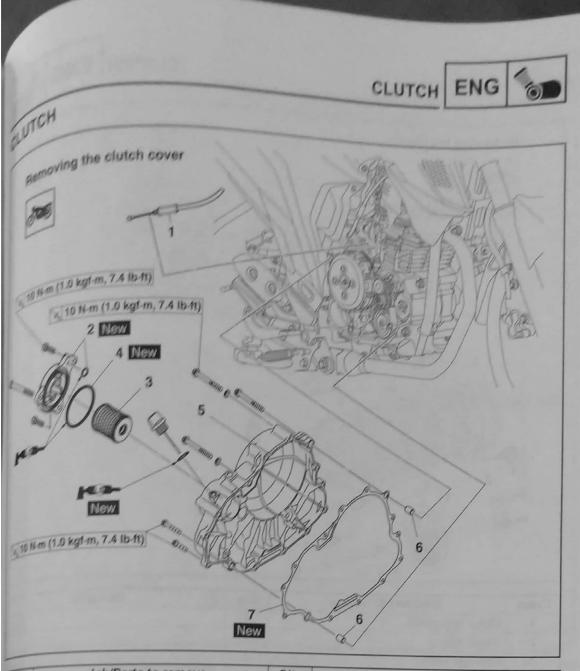
### 1. Install:

- Starter motor rear cover/brush holder set
   "1"
- · Starter motor yoke "2"

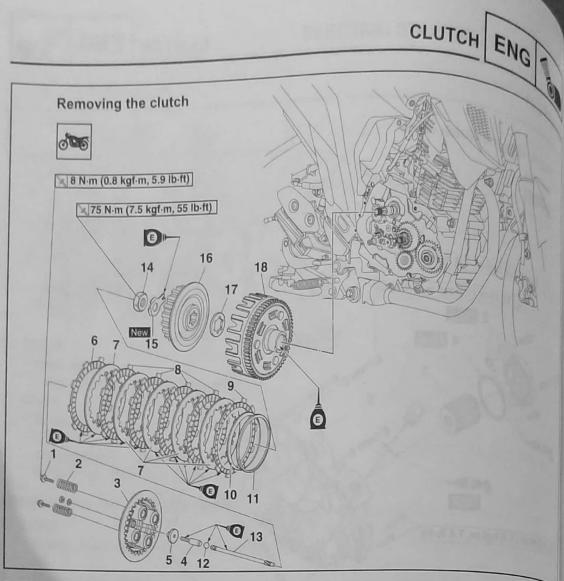
### TIP

Align the marks "a" on the starter motor yoke and starter motor rear cover/brush holder set made during disassembly.

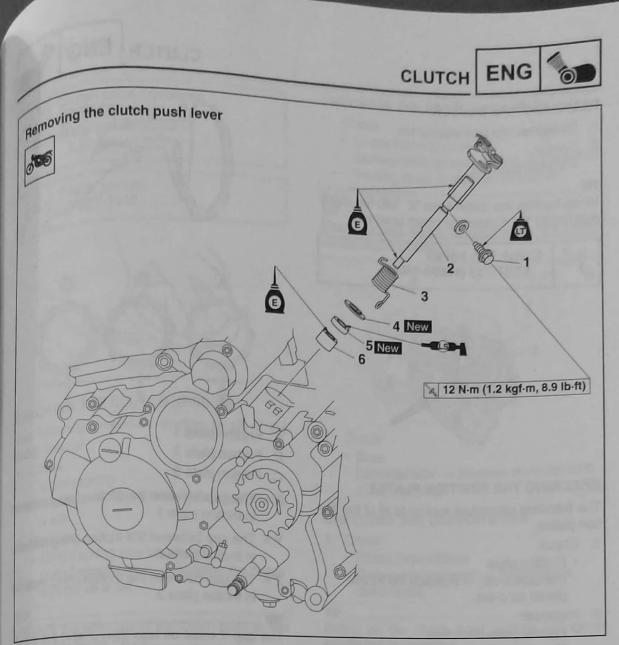




| Order | Job/Parts to remove          | Q'ty | Remarks                                                |
|-------|------------------------------|------|--------------------------------------------------------|
|       | Engine oil                   |      | Drain. Refer to "CHANGING THE ENGINE OIL" on page 3-9. |
| 1     | Clutch cable                 | 1    | Disconnect.                                            |
| 2     | Oil filter cover with O-ring | 1/1  |                                                        |
| 3     | Oil filter                   | 1    |                                                        |
| 4     | O-ring                       | 1    |                                                        |
| 5     | Clutch cover                 | 1    |                                                        |
| 8     | Dowel pin                    | 2    |                                                        |
| 7     | Clutch cover gasket          | 1    |                                                        |
|       |                              |      | For installation, reverse the removal procedure.       |



| Order | Job/Parts to remove      | Q'ty | Remarks                                          |
|-------|--------------------------|------|--------------------------------------------------|
| 1     | Clutch spring bolt       | 4    |                                                  |
| 2     | Clutch spring            | 4    |                                                  |
| 3     | Pressure plate           | 1    |                                                  |
| 4     | Short clutch push rod    | 1    | average of specialists                           |
| 5     | Clutch push plate washer | 1    |                                                  |
| 6     | Friction plate 1         | 1    |                                                  |
| 7     | Clutch plate             | 5    |                                                  |
| 8     | Friction plate 2         | 4    |                                                  |
| 9     | Friction Plate 3         | 1    |                                                  |
| 10    | Cushion spring washer    | 1    |                                                  |
| 11    | Plain washer             | 1    |                                                  |
| 12    | Ball                     | 1    |                                                  |
| 13    | Long push rod            | 1    |                                                  |
| 14    | Clutch boss nut          | 1    |                                                  |
| 15    | Lock washer              | 1    |                                                  |
| 16    | Clutch boss              | 1    |                                                  |
| 17    | Thrust washer            | 1    |                                                  |
| 18    | Clutch housing           | 1    |                                                  |
|       |                          |      | For installation, reverse the removal procedure. |



| Order | Job/Parts to remove                | Q'ty | Remarks                                          |
|-------|------------------------------------|------|--------------------------------------------------|
|       | Pressure plate                     |      | Refer to "CLUTCH" on page 5-38.                  |
| 1     | Clutch push lever bolt with washer | 1/1  |                                                  |
| 2     | Clutch push lever                  | 1    |                                                  |
| 3     | Clutch push lever spring           | 1    | market and R. C. aller Services                  |
| 4     | Circlip                            | 1    | 100000000000000000000000000000000000000          |
| 5     | Oil seal                           | 1    |                                                  |
| 6     | Bearing                            | 1    |                                                  |
|       |                                    |      | For installation, reverse the removal procedure. |

## CLUTCH



## REMOVING THE CLUTCH

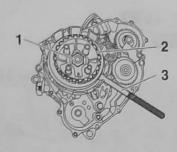
- 1. Straighten the lock washer tab.
- 2. Loosen:
  - Clutch boss nut "1"

TIP

While holding the clutch boss "2" with the clutch hub holder "3", loosen the clutch boss nut.



Clutch hub holder YSST-733 (90890-04086)



## CHECKING THE FRICTION PLATES

The following procedure applies to all of the friction plates.

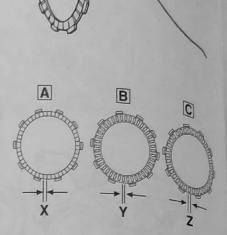
- 1. Check:
  - Friction plate
     Damage/wear → Replace the friction plates as a set.
- 2. Measure:
  - Friction plate thickness
     Out of specification → Replace the friction
     plates as a set.

TIP

Measure the friction plate at four places.



Friction plate 1 & 2 thickness 2.90–3.10 mm Wear limit 2.60 mm



- A. Friction plate 1
- B. Friction plate 2
- C. Friction plate 3
- X = The gap between the friction lining material in friction plate 1.
- Y = The gap between the friction lining malengin friction plate 2.
- Z = The gap between the friction lining maleral in friction plate 3.

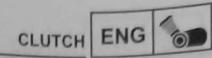
TIP\_

The gap Y must be less then Z and the gap? must less then gap X.

### **CHECKING THE CLUTCH PLATES**

The following procedure applies to all of the clutch plates.

- 1. Check:
  - Clutch plate
     Damage → Replace the clutch plates as a set.
- 2. Measure:
  - Clutch plate warpage
     (with a surface plate and feeler gauge "1")
     Out of specification → Replace the clutch plates as a set.



Clutch plate thickness 1.50-1.70 mm Warpage limit 0.20 mm

Feeler gauge YSST-1215



# CHECKING THE CLUTCH SPRINGS

The following procedure applies to all of the dutch springs.

## 1. Check:

Clutch spring
 Damage → Replace the clutch springs as a set.

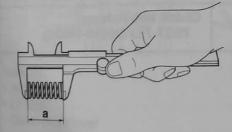
## 2 Measure:

Clutch spring free length "a"
 Out of specification → Replace the clutch springs as a set.

-10

Measure the warpage of the clutch plate at four places with feeler gauge.





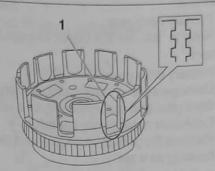
## CHECKING THE CLUTCH HOUSING

### 1. Check:

Clutch housing dogs "1"
 Damage/pitting/wear → Deburr the clutch housing dogs or replace the clutch housing.

### TIP

Pitting on the clutch housing dogs will cause erratic clutch operation.



### 2. Check:

Bush
 Damage/wear → Replace the bush and clutch housing.

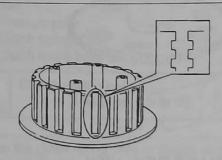
### CHECKING THE CLUTCH BOSS

### 1. Check:

Clutch boss splines
 Damage/pitting/wear → Replace the clutch boss.

### TIP

Pitting on the clutch boss splines will cause erratic clutch operation.



### CHECKING THE PRESSURE PLATE

### 1. Check:

• Pressure plate  ${\sf Cracks/damage} \to {\sf Replace}.$ 



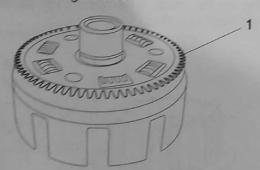
- 1. Check:
  - · Clutch push lever
  - · Short clutch push rod Damage/wear → Replace the defective part(s).

### CHECKING THE PRIMARY DRIVE GEAR

- 1. Remove:
  - · Primary drive gear Refer to "BALANCER GEAR" on page 5-52.
- 2. Check:
  - · Primary drive gear Damage/wear → Replace the primary drive gear and clutch housing as a set. Excessive noise during operation  $\rightarrow$ Replace the primary drive gear and clutch housing as a set.
- 3. Install:
  - · Primary drive gear Refer to "BALANCER GEAR" on page 5-52.

## CHECKING THE PRIMARY DRIVEN GEAR

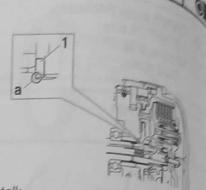
- 1. Check:
  - Primary driven gear "1" Damage/wear → Replace the primary drive gear and clutch housing as a set. Excessive noise during operation → Replace the primary drive gear and clutch housing as a set.



### INSTALLING THE CLUTCH

- 1. Install:
  - · Clutch housing
  - · Thrust washer "1"

Be sure the thrust washer sharp-edged corner "a" is positioned opposite side to the clutch boss.

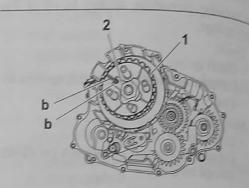


CLUTCH ENG

- 2. Install:
  - · Clutch boss "1"
  - Lock washer "2" New
  - · Clutch boss nut "3"

TIP

- Lubricate the clutch boss nut threads and threads lock washer mating surfaces with engine of
- Align the notch "a" in the lock washer low rib "b" on the clutch boss



- 3. Tighten:
  - · Clutch boss nut "1"

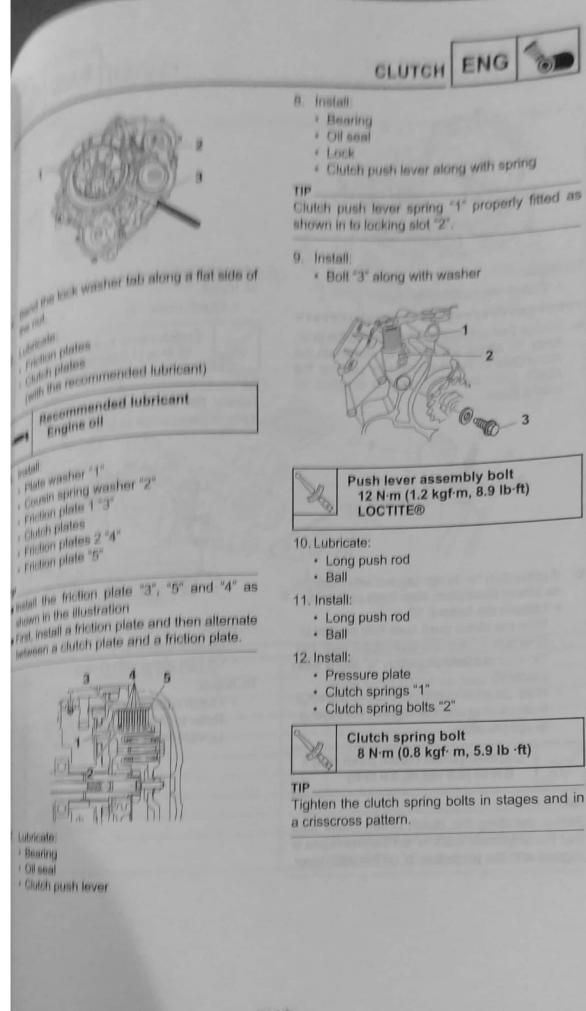


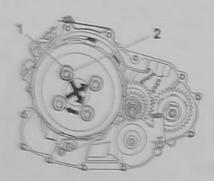
Clutch boss nut 75 N·m (7.5 kgf·m, 55 lb·ft)

While holding the clutch boss "2" with the clutch hub holder "3", tighten the clutch boss nut.



Clutch hub holder YSST-733 (90890-04086)



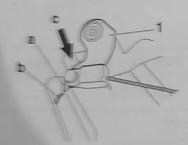


### 13. Adjust:

- Clutch mechanism free play

E. Check that projection "a" on the clutch push lever "1" aligns with mark "b" shown on the crankcase in the illustration by pushing the clutch push lever manually in direction "c" until it stops.

\*\*\*\*\*\*\*\*



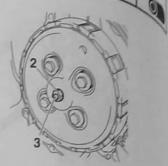
- b. If projection "a" is not aligned with mark "b" as above illustration, align them as follows:
  - Loosen the looknut "2"
  - With the clutch push lever fully pushed in direction "c", turn the short clutch push rod
     "a" in or out until projection "a" aligns with mark "b".
  - Hold the short clutch push rod to prevent it from moving and then tighten the locknut to specification,



Locknut (short clutch push rod) E N·m (0.8 kgf·m, 5.9 lb·ft)

### TIP

Before installing the clutch cover, make sure that the alignment mark "a" on the crankcase is aligned with the projection "b" on the push lever.



### 14 Install:

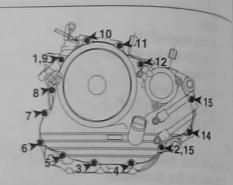
· Clutch cover



Clutch cover bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

### TID

Tighten the clutch cover bolts in the propertightening sequence as shown.

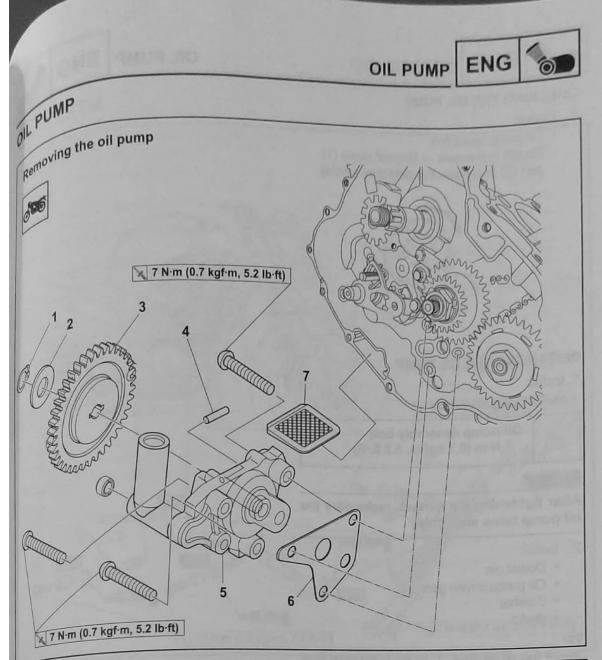


### 15. Install:

- · Oil filter element
- · Oil filter along with O-ring

### 16. Adjust:

 Clutch cable free play Refer to "ADJUSTING THE CLUTCH LEVER FREE PLAY" on page 3-11.



| Job/Parts to remove  | Q'ty | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Clutch housing       |      | Refer to "CLUTCH" on page 5-38.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Circlip              | 1    | A STATE OF THE PARTY OF THE PAR |
| Washer               | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Oil pump driven gear | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Dowel Pin            | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Oil pump assembly    | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Gasket               | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Oil Strainer         | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                      |      | For installation, reverse the removal procedure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

### CHECKING THE OIL PUMP

### 1. Check

Oil pump operation
 Rough movement → Repeat steps (1)
 and (2) or replace the defective part(s).



### INSTALLING THE OIL PUMP

### 1. Install:

Oil pump assembly



Oil pump assembly bolt 7 N-m (0.7 kgf·m, 5.2 lb·ft)

### NOTICE

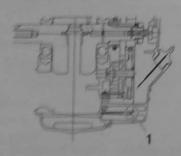
After tightening the screws, make sure the oil pump turns smoothly.

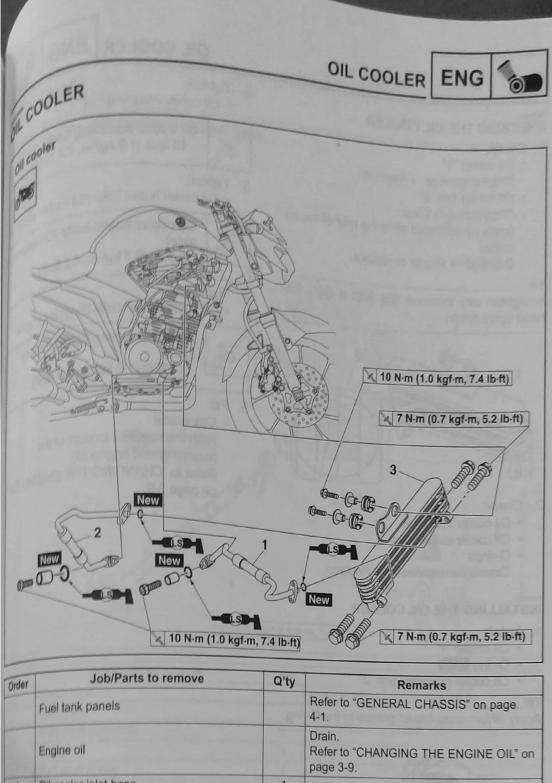
### 2. Install:

- Dowel pin
- . Oil pump driven gear
- Washer
- \* circlip

### TIP

Install the oil strainer "1" to the crankcase from taper side as shown.





| Order | Job/Parts to remove    | Q'ty | Remarks                                                      |
|-------|------------------------|------|--------------------------------------------------------------|
|       | Fuel tank panels       | - 01 | Refer to "GENERAL CHASSIS" on page 4-1.                      |
|       | Engine oil             |      | Drain,<br>Refer to "CHANGING THE ENGINE OIL" on<br>page 3-9. |
| 1     | Oil cooler inlet hose  | 1    |                                                              |
| 2     | Oil cooler outlet hose | 1    |                                                              |
| 3     | Oil cooler             | 1    | William Edward Landson                                       |

### CHECKING THE OIL COOLER

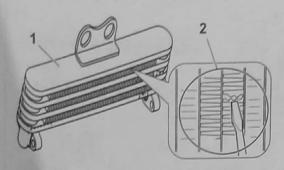
### 1. Check:

- · Oil cooler "1" Cracks/damage → Replace.
- · Oil cooler fins "2" Obstruction → Clean. Apply compressed air to the rear of the oil cooler.

Damage → Repair or replace.

TIP

Straighten any flattened fins with a thin, flathead screwdriver.



### 2. Check:

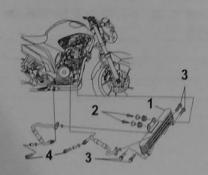
- · Oil cooler inlet hose
- · Oil cooler outlet hose
- O-rings Cracks/damage/wear → Replace.

### **INSTALLING THE OIL COOLER**

- 1. Install:
  - Oil cooler "1"
  - O-ring New
  - Oil cooler mounting bolt "2"

TIP

Apply lithium-soap-based grease to the O-ring.



### 2. Tighten:

· Oil cooler mounting bolt "2"



Oil cooler mounting bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

### 3. Tighten:

Tighten:

Oil cooler hoses bolts (Oil cooler side)



Oil cooler hoses bolts (Oil cool 7 N·m (0.7 kgf·m, 5.2 lb·ft)

### 4. Tighten:

Oil cooler hoses bolts (Engine side)

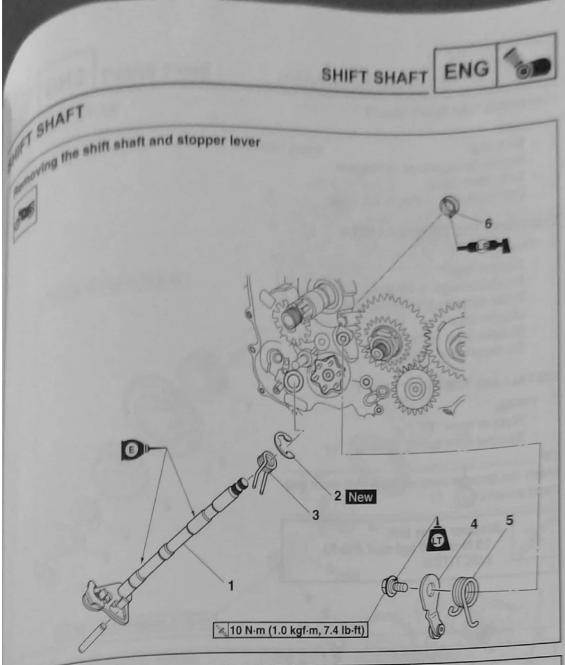


Oil cooler hoses bolts (Engine

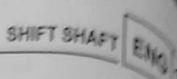
10 N·m (1.0 kgf·m, 7.4 lb·ft)

### 5. Fill:

 Crankcase (with the specified amount of the recommended engine oil) Refer to "CHANGING THE ENGINE OIL on page 3-9.



| Job/Parts to remove              | Q'ty | Remarks                               |
|----------------------------------|------|---------------------------------------|
| Clutch housing                   |      | Refer to "CLUTCH" on page 5-38.       |
| out arm                          | 1    |                                       |
| Shift shaft assembly             | 1    |                                       |
| Circlip                          | 1    |                                       |
| Shift shaft spring               | 1    |                                       |
| Stopper lever                    | 1    |                                       |
| Stopper lever spring             | 1    |                                       |
| Oil seal                         |      | For installation, reverse the removal |
| Mary may part I will be a second |      | procedure.                            |



### CHECKING THE SHIFT SHAFT

- 1. Check:
  - Shift shaft
     Bends damage wear → Replace.
  - Shift shaft spring Damage/wear → Replace.

## CHECKING THE STOPPER LEVER

- 1. Check:
  - Stopper lever Bends/damage → Replace. Roller turns roughly → Replace the stopper lever.
  - Stopper lever spring Damage/wear → Replace.

## INSTALLING THE SHIFT SHAFT

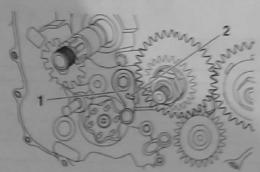
- 1. Install:
  - Stopper lever "1"
  - Stopper lever spring "2"

### TIP

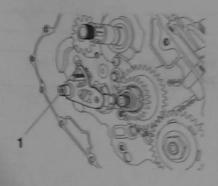
Mesh the stopper lever with the shift drum segment assembly.

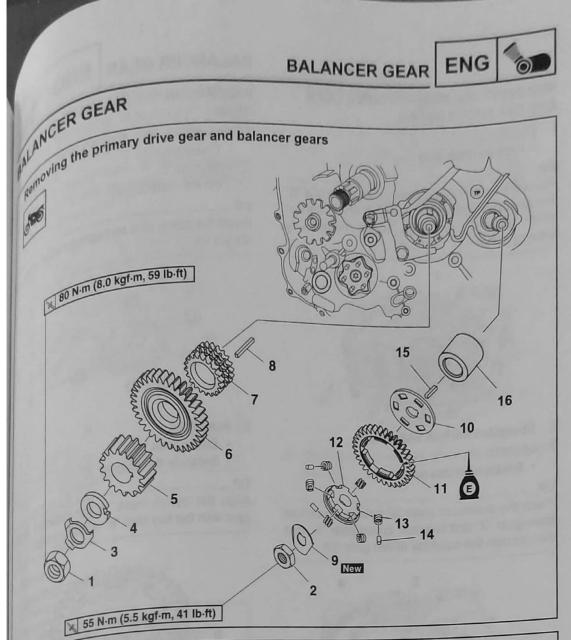


Stopper lever bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft) LOCTITE®



- 2. Install:
  - · Shift shaft "1"



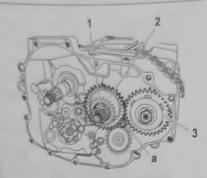


| Job/Parts to remove        | Q'ty | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|----------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                            |      | Refer to "CLUTCH" on page 5-38.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| der Clutch housing         | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| drive deal flat            | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| galancer driveri gedi Tita | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Lock washer                | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Washer                     | 1    | CONTRACTOR POLICE AND SOURCE OF THE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Primary drive gear         | 1    | MARIN SUPER VIOLENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Ralancer drive gear        | 1    | 100000000000000000000000000000000000000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| 7 Camchain sprocket        | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Straight key               | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| lock washer                | 1    | AND THE RESERVE OF THE PARTY OF |
| n Balancer gear plate 1    | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 1 Balancer drive gear      | 1    | No. of the last of |
| 2 Buffer boss              |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 3 Spring                   | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4 Dowel pin                | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 5 Straight key             | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 6 Collar                   | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

## REMOVING THE PRIMARY DRIVE GEAR AND BALANCER GEARS

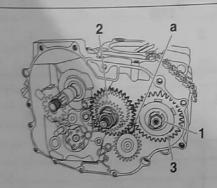
- 1. Loosen:
  - Primary drive gear nut "1"

Place the leather piece plate or leather piece "a" between balancer drive gear "2" and balancer driven gear "3", and then loosen the primary drive gear nut.



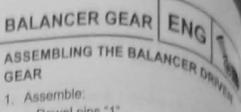
- 2. Straighten the lock washer tab.
- 3. Loosen:
  - · Balancer driven gear nut "1"

Place the aluminum plate "a" between balancer drive gear "2" and balancer driven gear "3", and then loosen the balancer driven gear nut.



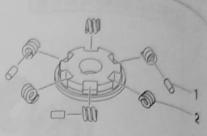
### CHECKING THE BALANCER GEARS AND PRIMARY DRIVE GEAR

- 1. Check:
  - · Balancer drive gear
  - · Balancer driven gear
  - · Buffer boss
  - Spring
  - · Dowel pin Cracks/damage/wear → Replace.
- 2. Check:
  - · Primary drive gear Refer to "CHECKING THE PRIMARY DRIVEN GEAR" on page 5-43.



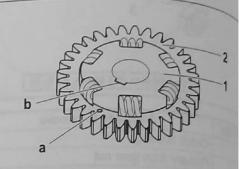
- · Dowel pins "1"
- . Springs "2" (to the buffer boss)

TIP Install the dowel pins and springs alternal



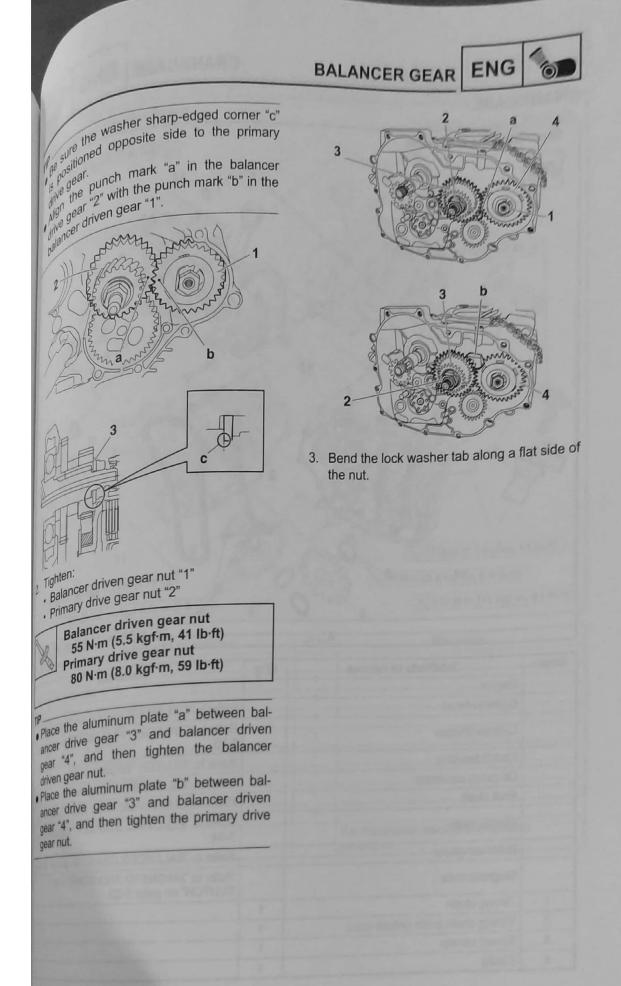
- 2. Assemble:
  - · Buffer boss "1"
  - Balancer driven gear "2"

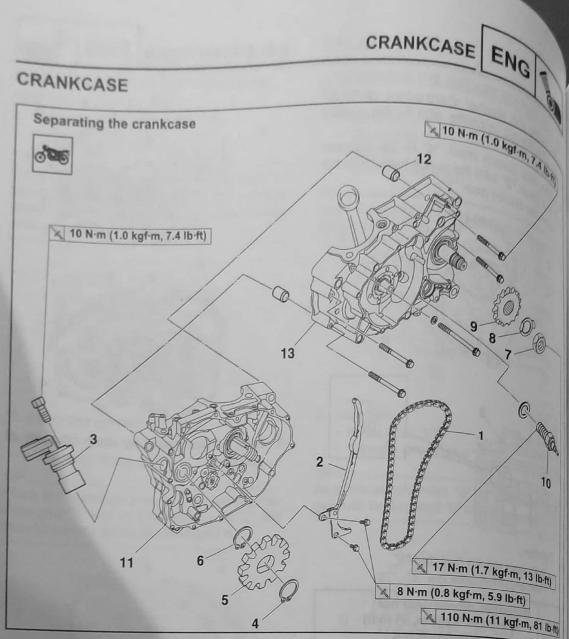
Align the punch mark "a" of balancer dright the key seat "b" of buffer has gear with the key seat "b" of buffer boss



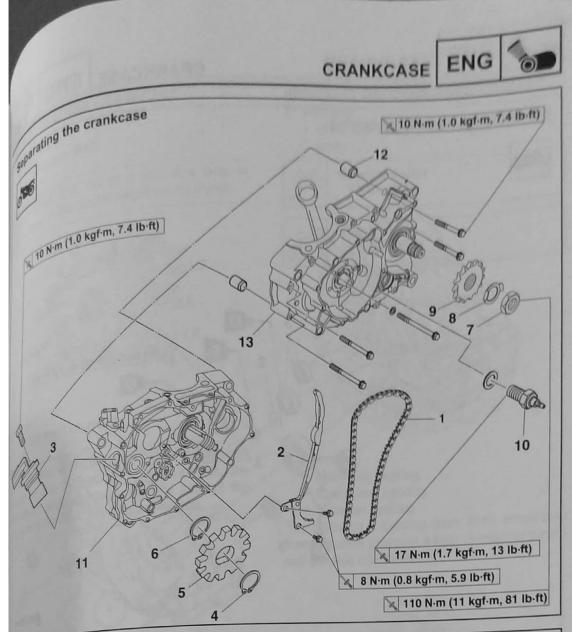
## INSTALLING THE PRIMARY DRIVE GEAR AND BALANCER GEARS

- 1. Install:
  - · Balancer driven gear "1"
  - Lock washer New
  - · Balancer drive gear "2"
  - · Primary drive gear
  - · Washer "3"
  - · Balancer driven gear nut
  - · Primary drive gear nut

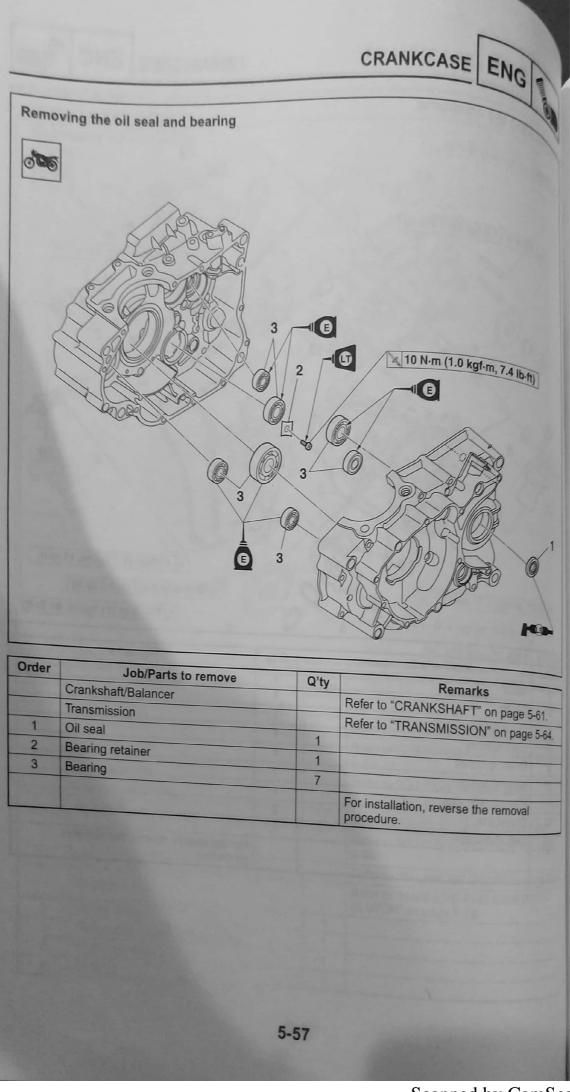


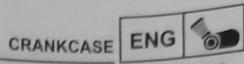


| Order | Job/Parts to remove              | Q'ty  | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------|----------------------------------|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|       | Engine                           |       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|       | Cylinder head                    |       | Refer to "CYLINDER HEAD" on page 5-6.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|       | Cylinder/Piston                  |       | Refer to "CYLINDER AND PISTON" on page 5-0. 5-23.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|       | Clutch housing                   |       | Refer to "CLUTCH" on page 5-38.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|       | Oil pump assembly                | 1110  | Refer to "OIL PUMP" on page 5-46.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|       | Shift shaft                      |       | Refer to "SHIFT SHAFT" on page 5-50.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|       | Starter motor                    | 1 200 | Refer to "ELECTRIC STARTER" on page 5-34.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|       | Balancer gears                   |       | Refer to "BALANCER GEAR" on page 5-52                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|       | Magneto rotor                    |       | Refer to "MAGNETO AND STARTER CLUTCH" on page 5-29.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| 1     | Timing chain                     | 1     | The straight of the straight o |
| 2     | Timing chain guide (intake side) | 1     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 3     | Speed sensor                     | 1     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4     | Circlip                          | 1     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |



| Job/Parts to remove | Q'ty | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|---------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Job/Parts to Tomo   | 1    | PRODUCTION OF STREET,  |
| Rotor               | 1    | The state of the s |
| Circlip             | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Drive sprocket nut  | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Lock washer         |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Drive sprocket      |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Neutral switch      | 1    | A Land and the same and the sam |
| Right crankcase     | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Dowel pin           | 2    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Left crankcase      | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                     |      | For installation, reverse the removal procedure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

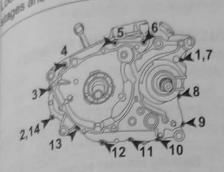




# SEPARATING THE CRANKCASE

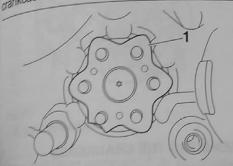
Remove: , Crankcase bolts

np each bolt 1/4 of a turn at a time, in one and in the proper sequence as shown losen each the proper sequence as shown.



. Shift drum segment

The shift drum segment "1" to the position in the illustration. In this part the illustration. In this position, the shown in segment teeth will not contact the shill brankcase during crankcase separation.



### 3. Remove:

· Right crankcase

Tap on one side of the crankcase with a soft face hammer. Tap only on reinforced portions of the crankcase, not on the crankcase mating surfaces. Work slowly and carefully and make sure the crankcase halves separate evenly.

## REMOVING THE CRANKCASE BEARING

#### 1. Remove:

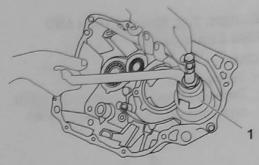
· Drive axle bearing with help of a bearing puller "1".



Bearing puller YSST-624A



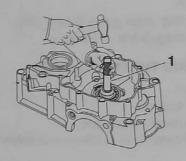
Cup-C YSST-620-C



#### 2. Remove:

- · Main axle bearing
- · Crankshaft bearing
- Balancer bearing

The following 3 bearing from RHS crankcase from the other side with a help of bearing punch and suitable attachment "1".





Bearing punch set YSST-951

#### 3. Remove:

Main axle bearing from LHS crankcase with help of a bearing puller.



Bearing puller YSST-624A



Cup-A YSST-620B

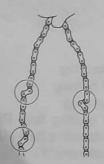
## CRANKCASE ENG

## CHECKING THE CRANKCASE

- 1. Thoroughly wash the crankcase halves in a mild solvent.
- 2. Thoroughly clean all the gasket surfaces and crankcase mating surfaces.
- 3. Check:
  - · Crankcase Cracks/damage → Replace.
  - Oil delivery passages Obstruction → Blow out with compressed

### CHECKING THE TIMING CHAIN AND **TIMING CHAIN GUIDE**

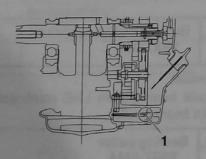
- 1. Check:
  - Timing chain Damage/stiffness → Replace the timing chain and camshaft sprocket as a set.



- 2. Check:
  - Timing chain guide (intake side) Damage/wear → Replace.

#### CHECKING THE OIL STRAINER

- 1. Check:
  - · Oil strainer Damage → Replace. Contaminants → Clean with solvent.



## CHECKING THE BEARINGS AND

- 1. Check:
  - Bearings
    Clean and lubricate the bearings
    the inner race with your fire Bearings Clean and law rotate the inner race with your fire movement → Replace Rough movement → Replace
  - Oil seal Damage/wear → Replace

## INSTALLING THE BEARING RETAINER

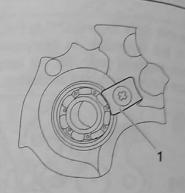
- - Bearing retainer "1"

TIP.

Apply locking agent (LOCTITE®) to the three



Bearing retainer screw 10 N·m (1.0 kgf·m, 7.4 lb-ft) LOCTITE®



#### ASSEMBLING THE CRANKCASE

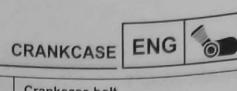
1. Thoroughly clean all the gasket mating surfaces and crankcase mating surfaces with a flat scraper "1".

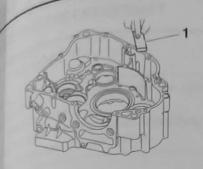
#### NOTICE

Do not use a screwdriver or any sharp instruments for removing the gasket.



Scraper YSST-612

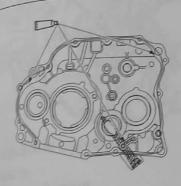




Apply: Sealant (onto the crankcase mating surfaces)

Yamaha bond No. 1215B TB-1215 (90890-85505)

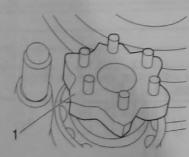
not allow any sealant to come into contact the oil gallery.



nstall:

· Right crankcase

Tum the shift drum segment "1" to the position shown in the illustration. In this position, the stift drum segment teeth will not contact the rankcase during crankcase installation.



Install-

· Crankcase bolts

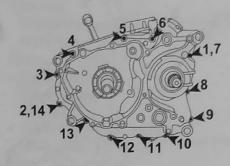


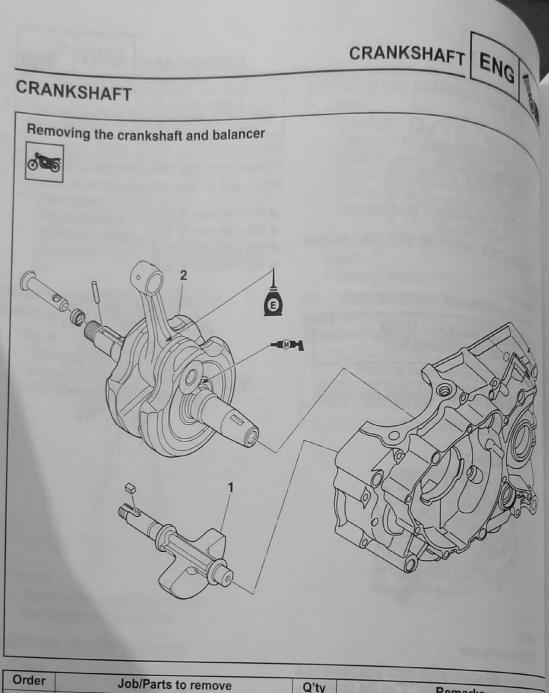
Crankcase bolt 10 N·m (1.0 kgf·m, 7.4 lb·ft)

TIP

Tighten each bolt 1/4 of a turn at a time, in stages and in the proper sequence as shown.

- M6 × 70 mm: 9, 10, 11
- M6 × 60 mm: 1, 12
- M6 × 55 mm: 2, 3, 8
- M6 × 45 mm: 4, 5, 6, 7





| Order | Job/Parts to remove | Q'ty | Remarks                                         |
|-------|---------------------|------|-------------------------------------------------|
|       | Crankcase           |      | Separate. Refer to "CRANKCASE" on page 5-55     |
| 1     | Balancer            | 1    | TOTAL OTTAINCASE on page 5-58                   |
| 2     | Crankshaft          | 1    |                                                 |
| 3     | Dowel pin           |      |                                                 |
| 4     | Clevis pin          |      | John B. S. Community of Many                    |
| 5     | Spring              |      |                                                 |
|       |                     | 1 33 | For installation, reverse the removal procedure |







# REMOVING THE CRANKSHAFT

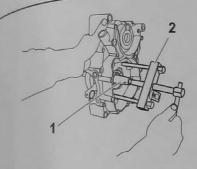
Remove: Crankshaft "1"

Premove the crankshaft with the crankcase tool "2".

separating the crankcase separating tool is anlared over the crankshaft. Make survey the crankshaft.

no not tap on the crankcase.

Crankcase separating tool YSST-265 (90890-01135) Bush YSST-893

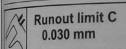


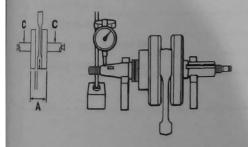
## CHECKING THE CRANKSHAFT

( Measure:

. Crankshaft runout Out of specification  $\rightarrow$  Replace the crankshaft, bearing or both.

Turn the crankshaft slowly.





### 2. Measure:

· Crankshaft width Out of specification → Replace the crankshaft.



Width A 69.25-69.30 mm

### 3. Check:

- · Crankshaft sprocket Damage/wear → Replace the crankshaft.
- Bearing Cracks/damage/wear → Replace the crankshaft.

#### 4. Check:

- · Crankshaft journal Scratches/wear → Replace the crankshaft.
- · Crankshaft journal oil passage Obstruction → Blow out with compressed

#### INSTALLING THE CRANKSHAFT

#### 1. Install:

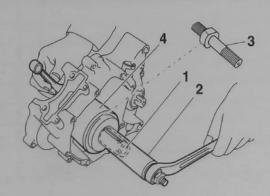
· Crankshaft "1"

#### TIP

Install the crankshaft with the crankshaft installer "2", stud YSST-1266 "3" and spacer (crankshaft installer) "4".



Crankshaft installer YSST-266 (90890-01284) Spacer (Crankshaft installer) YSST-267 (90890-04081) Crankcase installer (Extension) YSST- 1266



CRANKSHAFT ENG

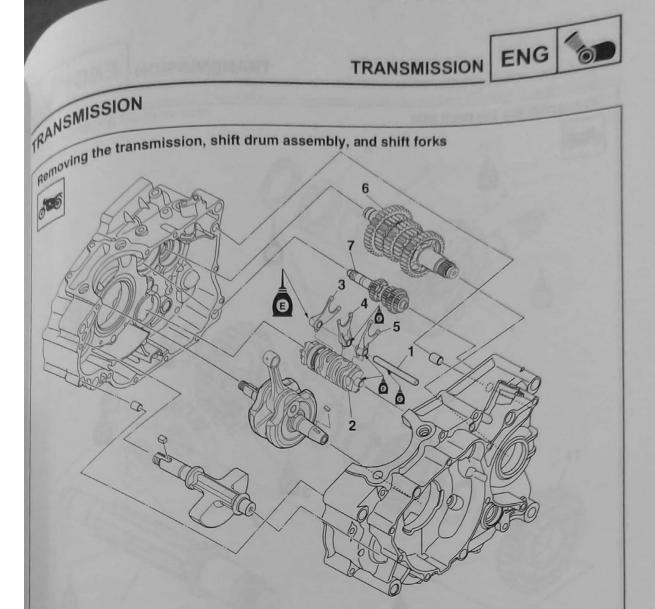
### NOTICE

To avoid scratching the crankshaft and to ease the installation procedure, lubricate the oil seal lips with lithium-soap-based grease and each bearing with engine oil.

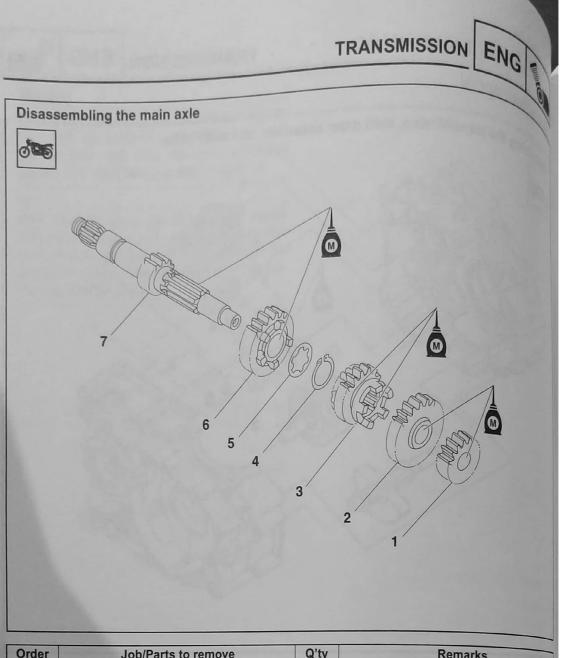
TIP

Hold the connecting rod at top dead center (TDC) with one hand while turning the nut of the crankshaft installer bolt with the other. Turn the crankshaft installer bolt until the crankshaft bottoms against the bearing.

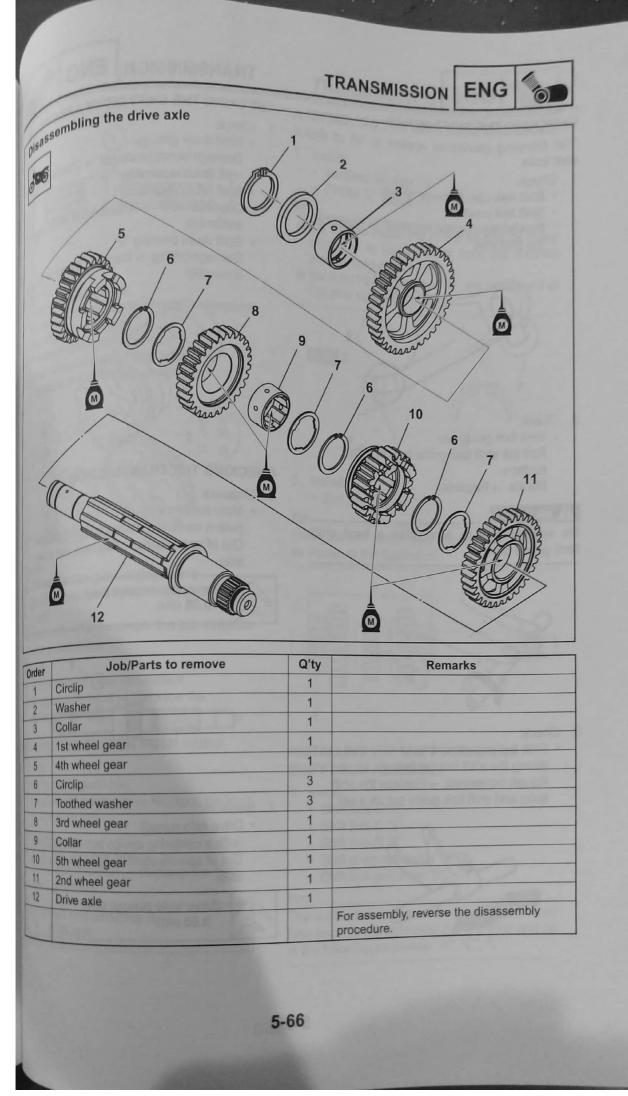
5-63



| _   | Job/Parts to remove  | Q'ty | Remarks                               |
|-----|----------------------|------|---------------------------------------|
| der | Job/Farts to remove  | 1-1  | Separate.                             |
|     | Crankcase            |      | Refer to "CRANKCASE" on page 5-55     |
|     |                      | 1    |                                       |
| 1   | Shift fork guide bar | 1    |                                       |
| 2   | Shift drum assembly  | 1    |                                       |
| 3   | Shift fork-R         | 1    |                                       |
| 4   | Shift fork-C         | 1    |                                       |
| 5   | Shift fork-L         | 1    |                                       |
| 6   | Drive axle assembly  | 1    |                                       |
| 7   | Main axle assembly   |      | For installation, reverse the removal |
|     |                      |      | procedure.                            |



| Order | Job/Parts to remove       | Q'ty | Remarks                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|-------|---------------------------|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1     | 2nd pinion gear           | 1    | common el properio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| 2     | 5th pinion gear           | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 3     | 3rd pinion gear           | 1    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 4     | Circlip                   | 1    | AND SOME OF THE PARTY OF THE PA |
| 5     | Toothed washer            | 1    | None of money (                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 6     | 4th pinion gear           | 1    | · · · · · · · · · · · · · · · · · · ·                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 7     | Main axle/1st pinion gear | 1    | 0.0000000000000000000000000000000000000                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|       |                           |      | For assembly, reverse the disassembly procedure.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |

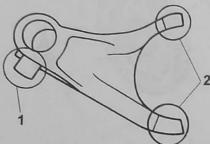




## **CHECKING THE SHIFT FORKS**

The following procedure applies to all of the shift forks.

- 1. Check:
  - Shift fork cam follower "1"
  - · Shift fork pawl "2"  $Bends/damage/scoring/wear \rightarrow Replace$ the shift fork.



## 2. Check:

 Shift fork guide bar Roll the shift fork guide bar on a flat surface.  $\mathsf{Bends} \to \mathsf{Replace}.$ 

### **WARNING**

Do not attempt to straighten a bent shift fork guide bar.



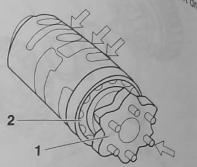
#### 3. Check:

· Shift fork movement (along the shift fork guide bar) Rough movement → Replace the shift forks and shift fork guide bar as a set.



- CHECKING THE SHIFT DRUM ASSEME Shift drum groov

  Damage/scratches/wear → Replace Shift drum groove
  - Shift drum segment Damage/wear → Replace the shift drun Shift drum segment "1"
  - Shift drum bearing Damage/pitting → Replace the shift dhun Shift drum bearing "2"

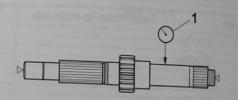


## CHECKING THE TRANSMISSION

- 1. Measure:
  - · Main axle runout (with a centering device and dial gauge 1) Out of specification ' Replace the main axle.



Main axle runout limit 0.08 mm



### 2. Measure:

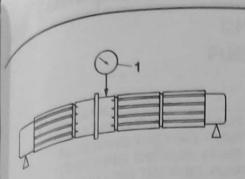
 Drive axle runout (with a centering device and dial gauge "1") Out of specification → Replace the drive axle.



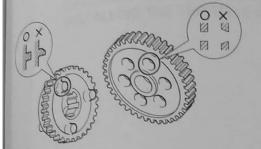
Drive axle runout limit 0.08 mm

## TRANSMISSION ENG





Transmission gears Transmission generation/pitting/wear → Replace the defective gear(s). , Transmission gear dogs Transmidamage/rounded edges → Craurs, the defective gear(s).

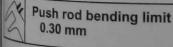


- , Transmission gear engagement (each pinion gear to its respective wheel Incorrect 

  Reassemble the transmission axle assemblies.
- Check:
- · Transmission gear movement Rough movement → Replace the defective part(s).

## CHECKING THE CLUTCH PUSH RODS

- Check:
- · Long clutch push rod Cracks/damage/wear → Replace the long clutch push rod.
- Measure:
- · Push rod bending limit Out of specification  $\rightarrow$  Replace the long clutch push rod.

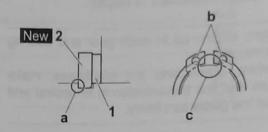


## ASSEMBLING THE MAIN AXLE AND DRIVE AXLE

- 1. Install:
  - · Toothed washer "1"
  - Circlip "2" New

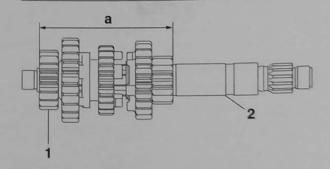
TIP

- Be sure to install the circlip so that its sharp edge "a" is facing away from the toothed washer and gear.
- Be sure the circlip ends "b" are positioned at the axle spline groove "c".



- 2. Install:
  - 2nd pinion gear "1"

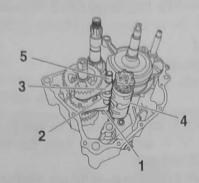
Press the 2nd pinion gear into the main axle"2", as shown in the illustration.



### INSTALLING THE SHIFT FORKS AND SHIFT DRUM ASSEMBLY

- 1. Install:
  - · Shift fork-L "1"
  - · Shift fork-C "2"
  - · Shift fork-R "3"
  - · Shift drum assembly "4"
  - · Shift fork guide bar "5"

The embossed marks on the shift forks should face towards the right side of the engine and be in the following sequence: "R", "C", "L".

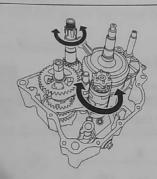


## 2. Check:

• Transmission Rough movement → Repair.

#### TIP.

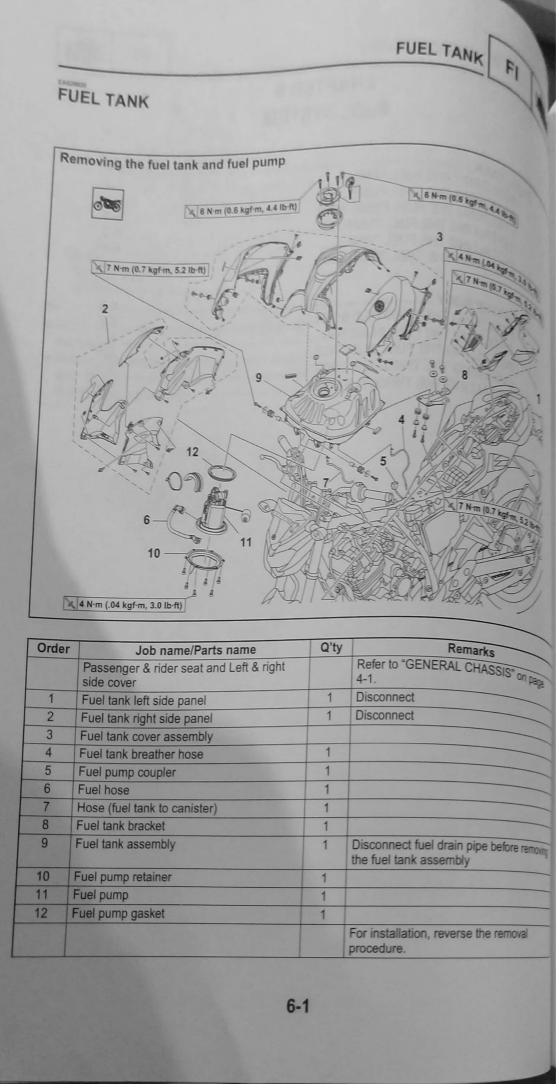
- Apply engine oil to each gear and bearing thoroughly.
- Before assembling the crankcase, make sure that the transmission is in neutral and that the gears turn freely.

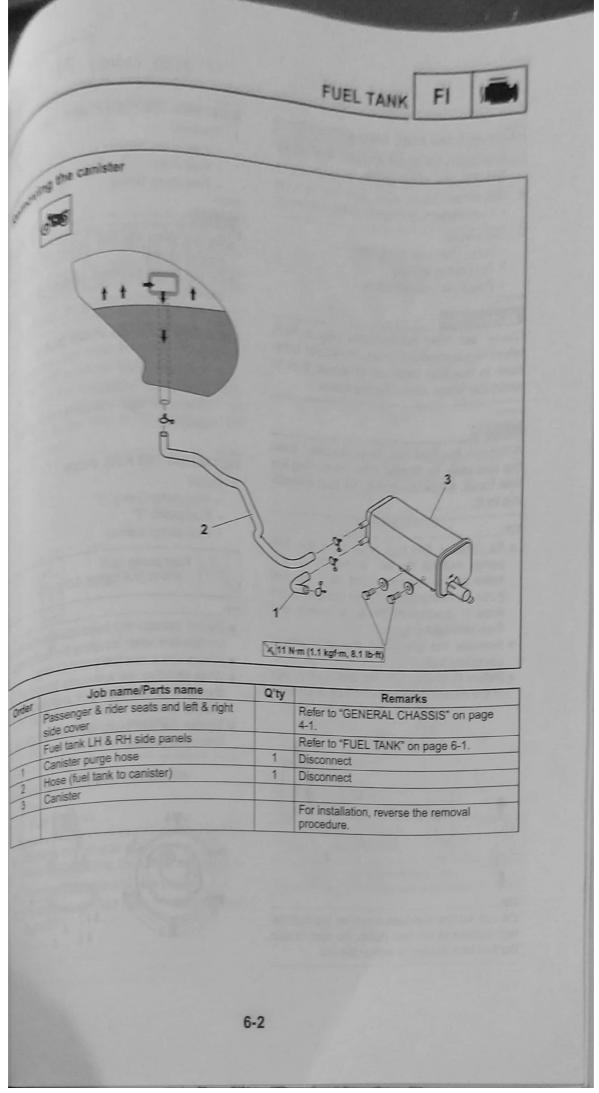




## CHAPTER 6 FUEL SYSTEM

| -ANK                         | 6-1 |
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| " - ALLING THE FUEL LAND     | 6-4 |
| CHECKING THE FUEL PRESSURE   | 6-4 |
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| OF ALLING THE FUEL INJECTOR  | 6-7 |
| "coking The THRUTTLE BODY    | 6-7 |
| INSTALLING THE THROTTLE BODY | 6-7 |
| NSTALLING                    |     |







## REMOVING THE FUEL TANK

- 1. Extract the fuel in the fuel tank through the fuel tank cap with a pump.
- 2. Disconnect:
  - · Fuel hose
- 3. Disconnect:
  - · Hose (fuel tank to canister)
  - · Fuel pump coupler
  - · Fuel tank breather hose

## **WARNING**

Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hoses.

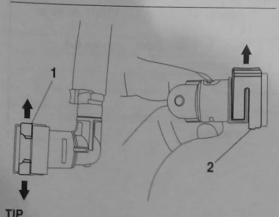
EGA20020

#### NOTICE

Although the fuel has been removed from the fuel tank, be careful when removing the fuel hose, since there may be fuel remaining in it.

TIP

- To remove the fuel hose from the fuel pump, expand the two latches "1" on the sides of the connector and slide the fuel hose connector cover "2" on the end of the hose in direction of the arrow shown, and then remove the hose.
- Remove the fuel hose manually without using any tools.
- Before removing the hose, place a few rags in the area under where it will be removed.



Do not set the fuel tank down on the installation surface of the fuel pump. Be sure to lean the fuel tank against a wall or the like.

## REMOVING THE FUEL PUMP

- Remove:
  - · Fuel pump retainer
  - · Fuel pump
  - · Fuel pump O-ring

EGA14720

#### NOTICE

- Do not drop the fuel pump or give
- strong snock.

   Do not touch the base section of the

## CHECKING THE FUEL PUMP BODY

- - · Fuel pump body Obstruction → Clean. Obstruction Cracks/damage → Replace fuel purities

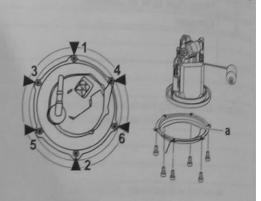
## INSTALLING THE FUEL PUMP

- 1. Install:
  - · Fuel pump O-ring "1"
  - · Fuel pump "2"
  - · Fuel pump retainer



Fuel pump bolt 4 N·m (0.4 kgf·m, 3.0 lb·ft)

- Do not damage the installation surfaces of the fuel tank when installing the fuel pump
- Always use a new fuel pump O-ring.
- While installing, the fuel pump projection and the fuel pump projection are the fuel pump projection and the fuel pump projection are the fuel pump projection and the fuel pump projection are the fuel pump projection and the fuel pump projection are the fuel pump projection and the fuel pump projection are the fuel pump projection and the fuel pump projection are the fuel pump projection and the fuel pump projection are the fuel pump projection and the fuel pump projection are the fuel pump projection and the fuel pump projection are the fuel pump projection are the fuel pump projection and the fuel pump projection are the fuel pump projecti should fit to the fuel tank and fuel pung
- Tighten the fuel pump bolts in stages in a crisscross pattern.



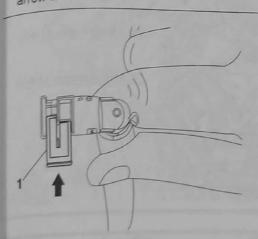


## INSTALLING THE FUEL TANK

- Install;
- . Fuel tank
- Connect: . Fuel hose

when installing the fuel hose, make sure that it is securely connected, and that the that the fuel hose connector cover on the fuel hose is in the correct position, otherwise the fuel hose will not be properly installed.

- Install the fuel hose securely onto the fuel pump until a distinct "click" is heard.
- To install the fuel hose onto the fuel pump, slide the fuel hose connector cover "1" on the end of the hose in the direction of the arrow shown.

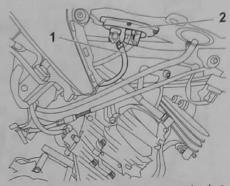


- Connect:
  - · Fuel pump coupler
  - · Hose (fuel tank to canister)
  - · Fuel tank breather hose

## CHECKING THE FUEL PRESSURE

- Check:
  - · Fuel pressure
- a. Remove the left side cover. Refer to "GENERAL CHASSIS" on page 4-1.
- b. Remove right side fuel tank panel
- Disconnect the fuel hose "1" from the fuel pump "2".

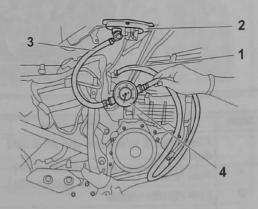
**WARNING** Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hoses.



- c. Connect the fuel pressure adapter "3" between the fuel hose "1" and fuel pump "2".
- d. Connect the pressure gauge "4" to fuel pressure adapter "3".



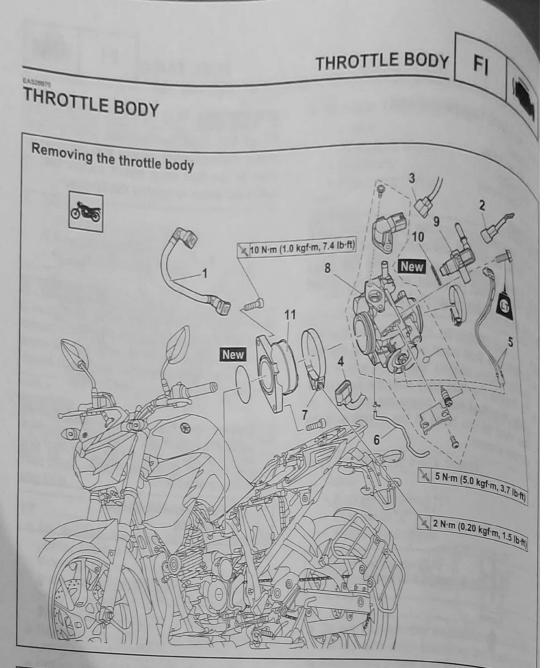
Fuel pressure gauge **INS-006** 



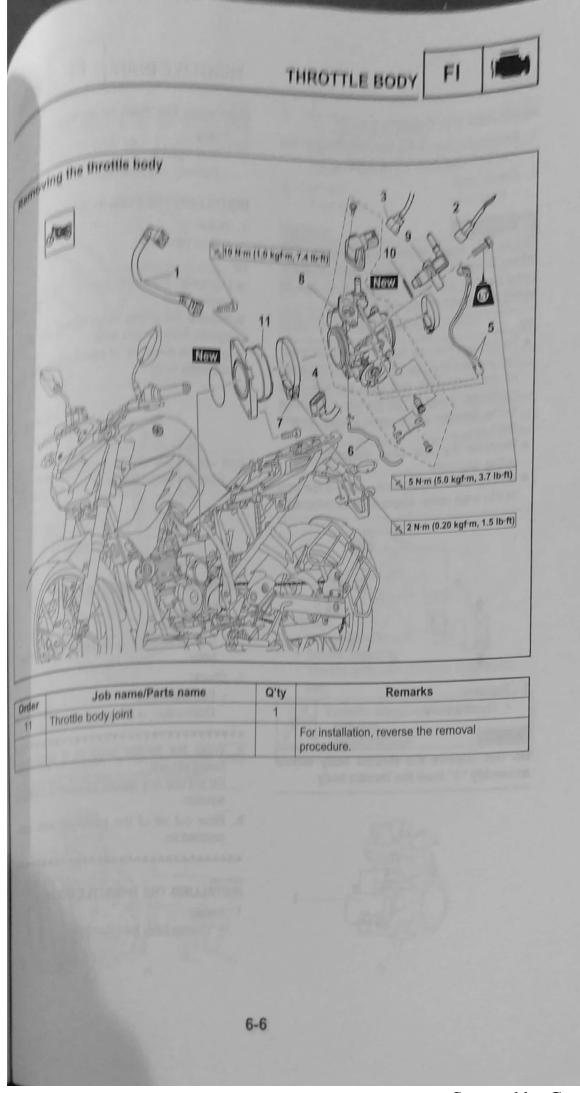
- e. Start the engine.
- Measure the fuel pressure.

Fuel pressure 220-300 kPa

Faulty → Replace the fuel pump. \*\*\*\*



| Order | Job name/Parts name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Q'ty | Pomed                                         |
|-------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|-----------------------------------------------|
|       | Passenger & rider seats and left & right side covers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 2.9  | Remarks  Refer to "GENERAL CHASSIS" on page   |
| 1     | Fuel hose                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 1    |                                               |
| 2     | Fuel injector coupler                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1    | Disconnect.                                   |
| 3     | FID (fast idle device) coupler                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1    |                                               |
| 4     | Throttle body sensor assembly coupler                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1    | Disconnect.                                   |
| 5     | Throttle cables                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 2    | Disconnect.                                   |
| 6     | Canister purge hose                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 1    | Disconnect.                                   |
| 7     | Throttle body joint clamp screw                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      | Disconnect.                                   |
| 8     | Throttle body                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 2    | Loosen.                                       |
| 9     | Fuel injector                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 1    |                                               |
| 10    | Fuel injector O-ring                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 1    |                                               |
|       | The State of the S |      | NOTICE                                        |
|       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |      | The throttle body should not be disassembled. |



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## REMOVING THE THROTTLE BODY

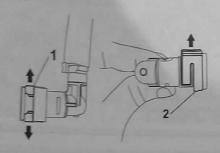
- Extract the fuel in the fuel tank through the fuel tank filler hole with a pump.
- Disconnect
  - · Fuel hose

## **WARNING**

Cover fuel hose connections with a cloth when disconnecting them. Residual pressure in the fuel lines could cause fuel to spurt out when removing the hoses.

### TIP

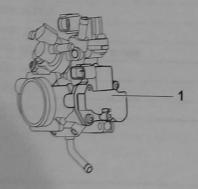
- To remove the fuel hose from the fuel injection. tor, expand the two latches "1" on the sides of the connector and slide the fuel hose connector cover "2" on the end of the hose in the direction of the arrow shown, remove the hose.
- Remove the fuel hose manually without using any tools.
- Before removing the hose, place a few rags in the area under where it will be removed.



- 3. Remove:
  - · Throttle body

#### NOTICE

Do not remove the throttle body sensor assembly "1" from the throttle body.



## CHECKING THE FUEL INJECTOR

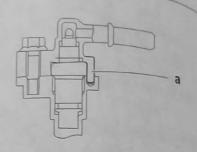
- 1. Check
  - · Fuel injector Damage -> Replace.

## INSTALLING THE FUEL INJECTOR

- 1. Install:
  - · Fuel injector

- Lubricate the fuel injector Oring
- engine oil.

  Replace the O-ring when taking out of the country of
- Insert the dowel "a" of injector into the house



## CHECKING THE THROTTLE BODY

- 1. Check:
  - · Throttle body Cracks/damage → Replace the throttle body.
- 2. Check:
  - · Fuel passages Obstruction → Clean.
- \*\*\*\*\*\*\* a. Wash the throttle body in a petroleum based solvent.

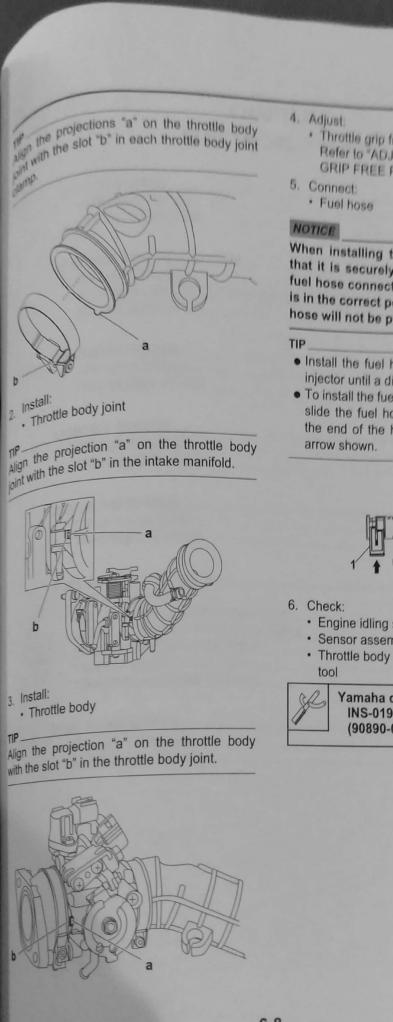
Do not use any caustic carburetor cleaning solution.

b. Blow out all of the passages with compressed air.

\*\*\*\*\*

### **INSTALLING THE THROTTLE BODY**

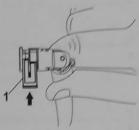
- 1. Install:
  - · Throttle body joint clamps



· Throttle grip free play Refer to "ADJUSTING THE THROTTLE GRIP FREE PLAY" on page 3-7

When installing the fuel hose, make sure that it is securely connected, and that the fuel hose connector cover on the fuel hose is in the correct position, otherwise the fuel hose will not be properly installed.

- Install the fuel hose securely onto the fuel injector until a distinct "click" is heard.
- To install the fuel hose onto the fuel injector, slide the fuel hose connector cover "1" on the end of the hose in the direction of the



- · Engine idling speed
- · Sensor assembly
- Throttle body with Yamaha diagnostic

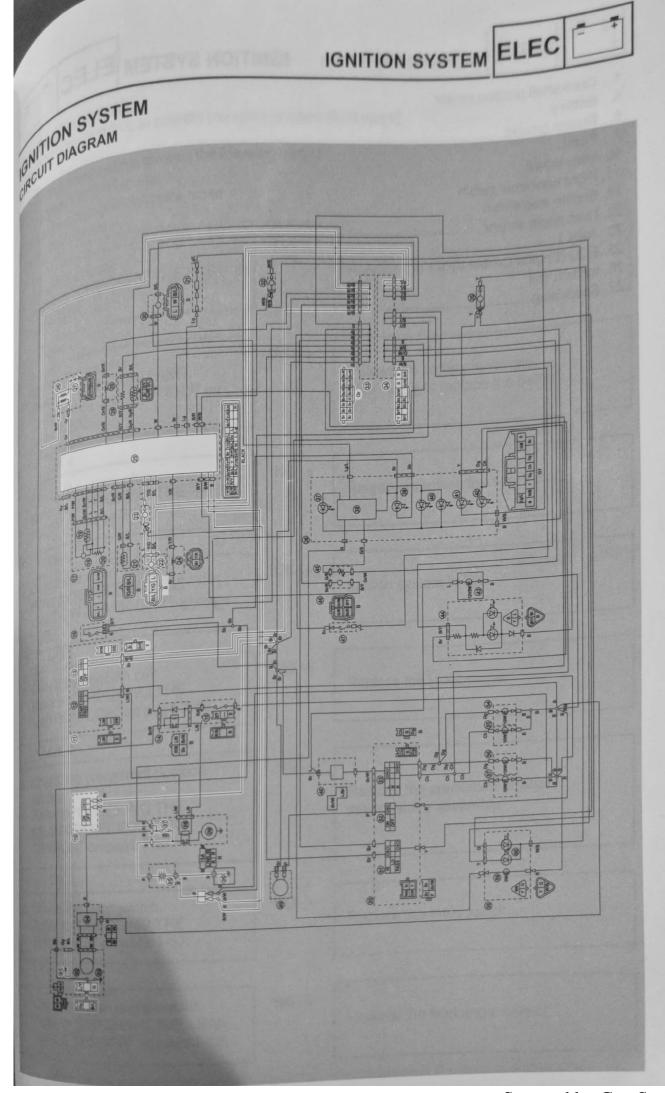
Yamaha diagnostic tool INS-019 (90890 - 03254)



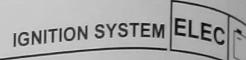
## CHAPTER 7 ELECTRICAL SYSTEM

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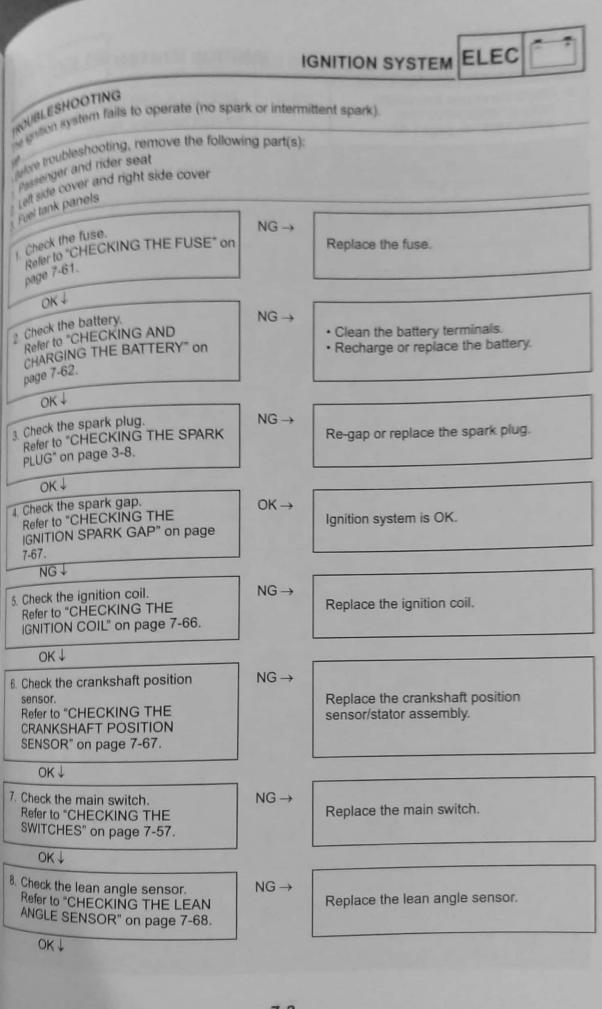
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|-----------------------------------------------------------------------------------------|------|
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| CHECKING THE BULBS AND BULB SOCKETS                                                     | 7.5  |
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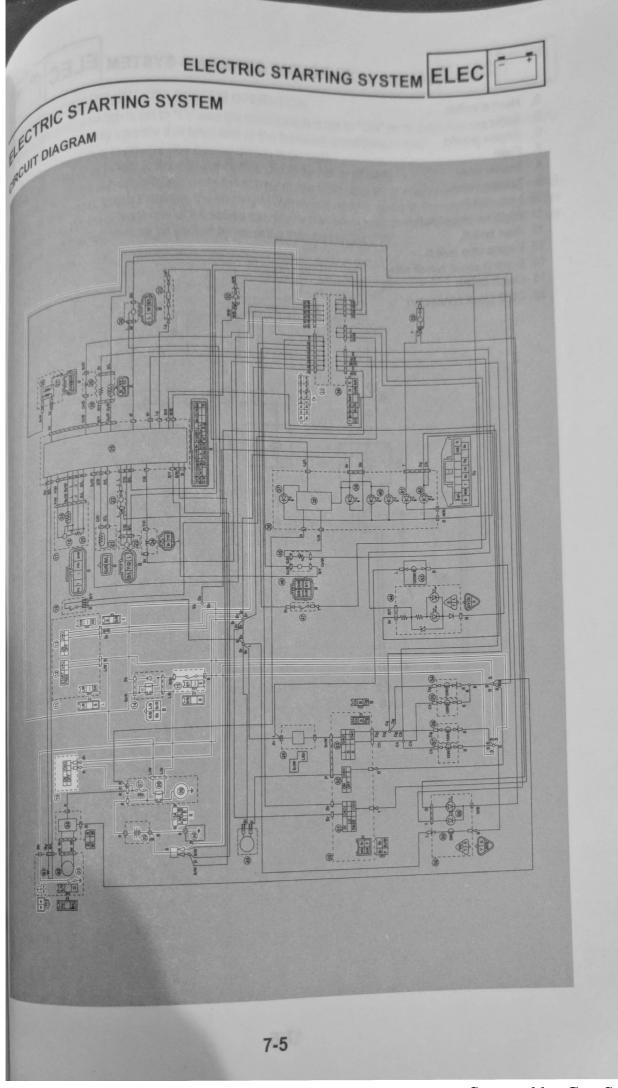
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- 1. Crankshaft position sensor
- 5. Battery
- 6. Engine ground
- 7. Fuse
- 10. Main switch
- 11. Right handlebar switch
- 13. Engine stop switch
- 22. Lean angle sensor
- 23. Joint 1
- 25. ECU (Engine Control Unit)
- 26. Ignition coil
- 27. Spark plug



IGNITION SYSTEM ELEC The engine stop switch is faulty. Replace 9. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 7-57.  $NG \rightarrow$ OK \ 10. Check the entire ignition system Properly connect or repair the ignition  $NG \rightarrow$ wiring. Refer to "CIRCUIT DIAGRAM" on page 7-1. OK↓ Replace the ECU. 7-4

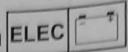


# ELECTRIC STARTING SYSTEM ELEC



- 3. Neutral switch
- 5. Battery
- 6. Engine ground
- 7. Fuse
- 8. Starter relay
- 9. Starter motor
- 10. Main switch
- 11. Right handlebar switch
- 12. Start switch
- 13. Engine stop switch
- 14. Starting circuit cut-off relay
- 15. Clutch switch
- 33. J/C 2 (Joint connector)

## ELECTRIC STARTING SYSTEM ELEC



FARTING CIRCUIT CUT-OFF SYSTEM OPERATION

Standing stop switch is set to "O" and the mail. \$1ARTING CIRCUIT OPERATION

\$1ARTING circuit of the set to "O" and the main switch is set to "ON" (both switches are closed), the specific motor can only operate if at least one of the following conditions is maintained by the switches are closed), the specific motor can only operate if at least one of the following conditions is maintained by the switches are closed), the specific motor can only operate if at least one of the following conditions is maintained by the switches are closed). engine stop switch is set to "ON" (both switch is set to "ON" (both switch is set to "ON") (both switch is closed).

The transmission is in neutral (the neutral switch is closed).

The dutch lever is pulled to the handlebar (the clutch switch is closed).

transmission is pulled to the handlebar (the clutch switch is closed).

The transmission is pulled to the handlebar (the clutch switch is closed).

The clutch lever is pulled to the handlebar (the clutch switch is closed). The clutch level is placed in the clutch switch is closed).

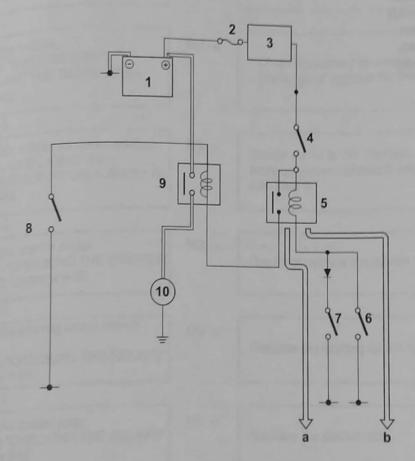
The clutch level is placed in the clutch switch is closed).

The clutch level is placed in the clutch switch is closed).

The clutch level is placed in the clutch switch is closed).

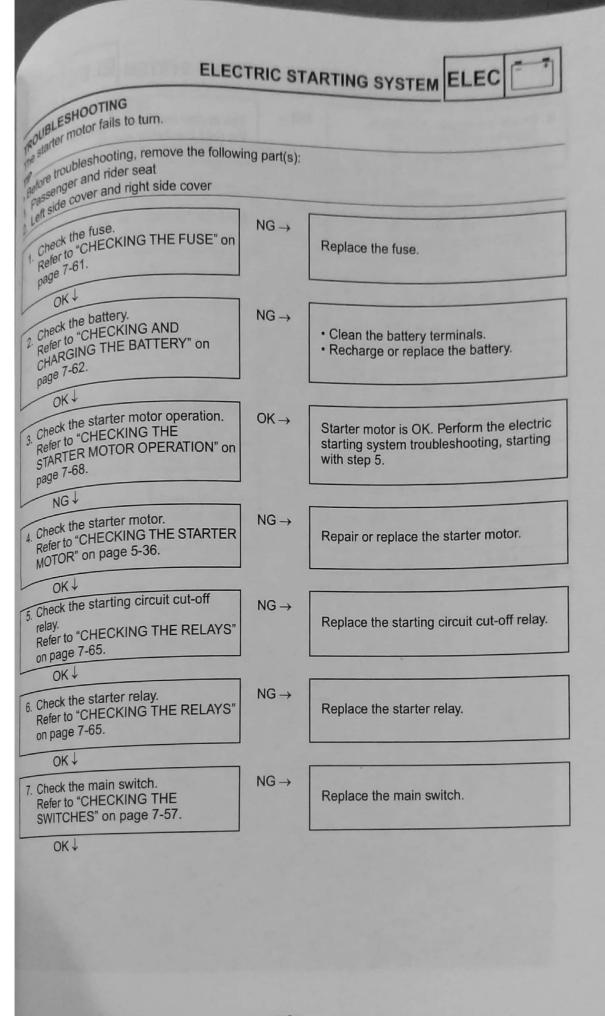
The clutch level is placed in the clutch switch is closed).

The clutch level is placed in the clutch switch is closed). The starting circuit out on rollar prevents the starter motor from operating when neither of these conditions has been met. In this instance, the starting circuit cut-off relay is open so current cannot reach the post motor. When at least one of the above conditions has been met. The starting circuit cut-off relay is open so current cannot reach the motor, and the engine can be started by presented by pre When at least one of the above conditions has been met, the starting circuit cut-off relay is open so current cannot reach the point motor. When at least one of the above conditions has been met, the starting circuit cut-off relay is open so current cannot reach the point motor. When at least one of the above conditions has been met, the starting circuit cut-off relay and the engine can be started by pressing the start switch "C". started by pressing the start switch "®".

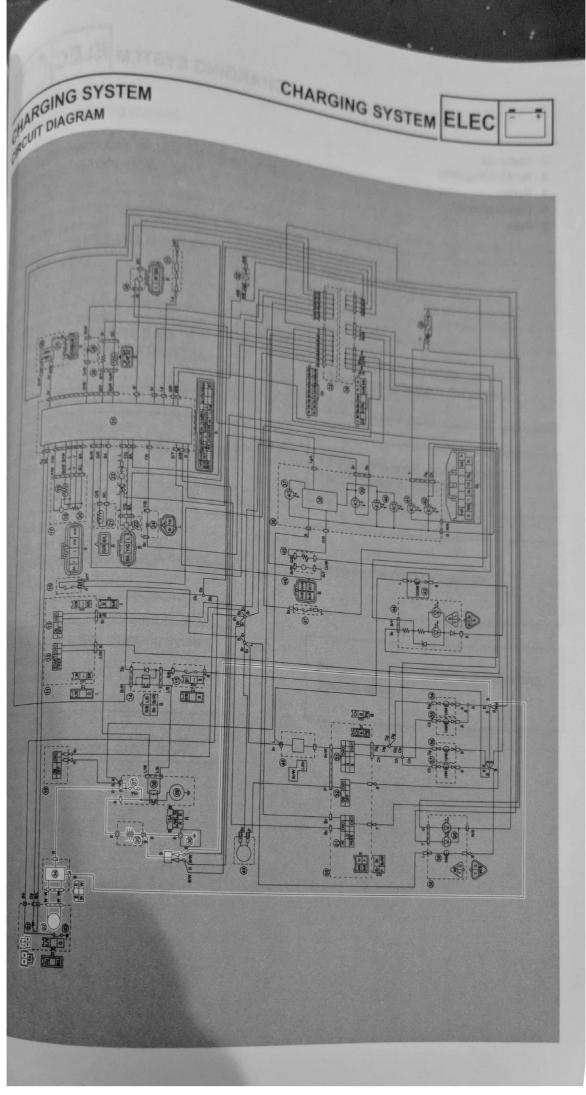


## ELECTRIC STARTING SYSTEM ELECT

- a. WHEN THE TRANSMISSION IS IN NEUTRAL
- b. WHEN CLUTCH LEVER IS PULLED TO THE HANDLEBAR
- 1. Battery
- 2. Fuse
- 3. Main switch
- 4. Engine stop switch
- 5. Starting circuit cut-off relay
- 6. Clutch switch
- 7. Neutral switch
- 8. Start switch
- 9. Starter relay
- 10. Starter motor

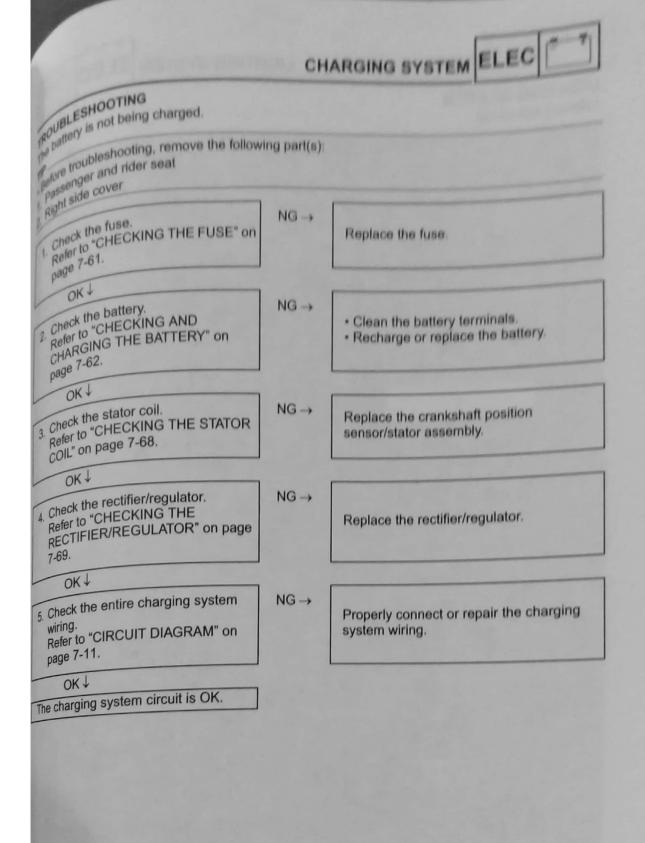


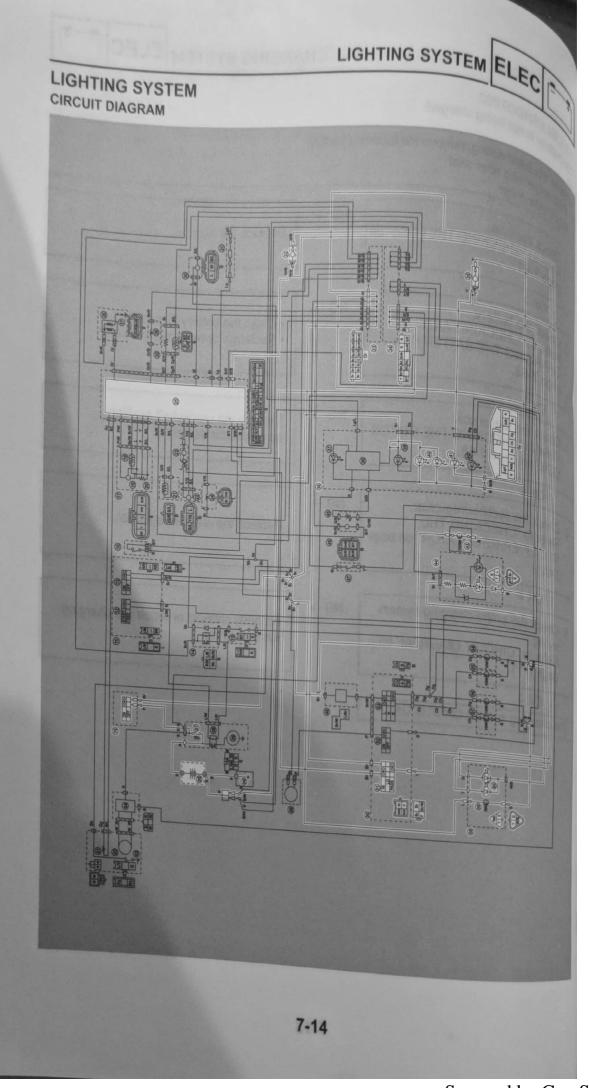
### ELECTRIC STARTING SYSTEM ELEC The engine stop switch is faulty. Replace $NG \rightarrow$ 8. Check the engine stop switch. Refer to "CHECKING THE SWITCHES" on page 7-57. OKI $NG \rightarrow$ 9. Check the neutral switch. Replace the neutral switch. Refer to "CHECKING THE SWITCHES" on page 7-57. OK 10. Check the clutch switch. NG -> Replace the clutch switch. Refer to "CHECKING THE SWITCHES" on page 7-57. OK \ The start switch is faulty. Replace the right $NG \rightarrow$ 11. Check the start switch. Refer to "CHECKING THE SWITCHES" on page 7-57. OK↓ 12. Check the entire starting system $NG \rightarrow$ Properly connect or repair the starting Refer to "CIRCUIT DIAGRAM" on page 7-5. OK 1 The starting system circuit is OK. 7-10



# CHARGING SYSTEM ELEC 2. Stator coil 4. Rectifier/Regulator 5. Battery 6. Engine ground7. Fuse

7-12





Scanned by CamScanner

LIGHTING SYSTEM ELEC Battery Engine ground 6 Fuse switch
7 Main switch
10 ECU (Engine Control Unit)
25 Joint 2
26 Joint 2 (Joint connector)
27 Joint 3 (Joint connector)
28 Joint 3
30 Meter assembly
30 Meter assembly
31 Joint 3
32 Meter assembly 30 Meter assembly 40. Meter light 41. High beam indicator light 43. License plate light 43. prake/tail light Brake/tail light 50. Left handlebar switch 50. Len mar switch and pass switch
51. pinmer switch assembly 58. Headlight assembly 58. readinght assembly 59. Auxiliary light right 60. Headlight 7-15

TROUBLESHOOTING
Any of the following fail to light: headlight, high beam indicator light, talllight, auxiliary light or meter light

- Before troubleshooting, remove the following part(s):
- 1. Passenger and rider seat
- 2. Left side cover and right side cover
- 3. Headlight
  - 1. Check the each bulbs and bulb sockets condition. Refer to "CHECKING THE BULBS AND BULB SOCKETS" on page 7-60.

 $NG \rightarrow$ 

Replace the bulb(s) and bulb socket(s).

OK 1

2. Check the fuse. Refer to "CHECKING THE FUSE" on page 7-61.

NG →

Replace the fuse.

OK 1

3. Check the battery. Refer to "CHECKING AND CHARGING THE BATTERY" on page 7-62.

NG →

· Clean the battery terminals. · Recharge or replace the battery

OK \

4. Check the main switch. Refer to "CHECKING THE SWITCHES" on page 7-57.  $NG \rightarrow$ 

Replace the main switch.

OK ↓

Check the dimmer and pass. Refer to "CHECKING THE SWITCHES" on page 7-57.

 $NG \rightarrow$ 

The dimmer switch is faulty. Replace the left handlebar switch.

OK ↓

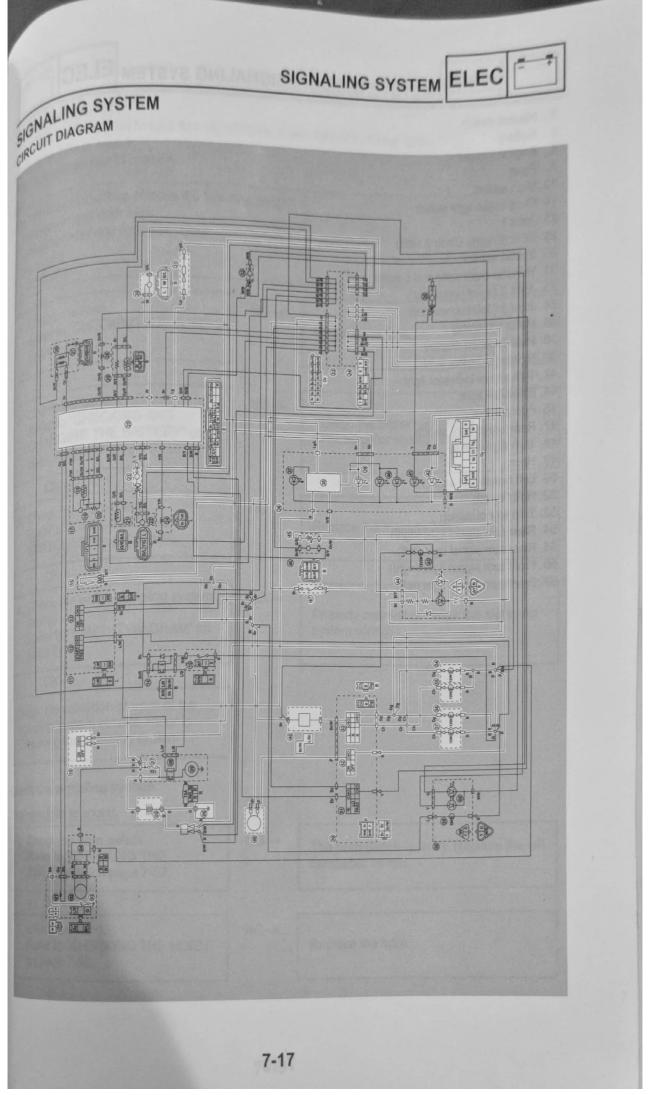
6. Check the entire lighting system Refer to "CIRCUIT DIAGRAM" on page 7-14.

 $NG \rightarrow$ 

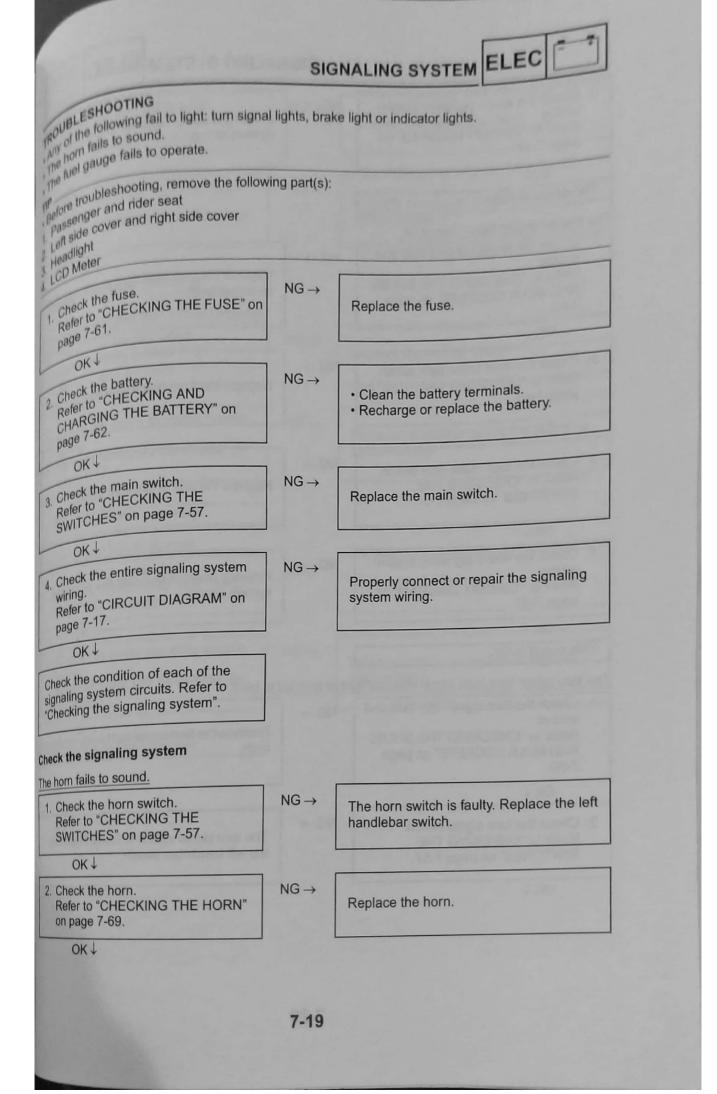
Properly connect or repair the lighting system wiring.

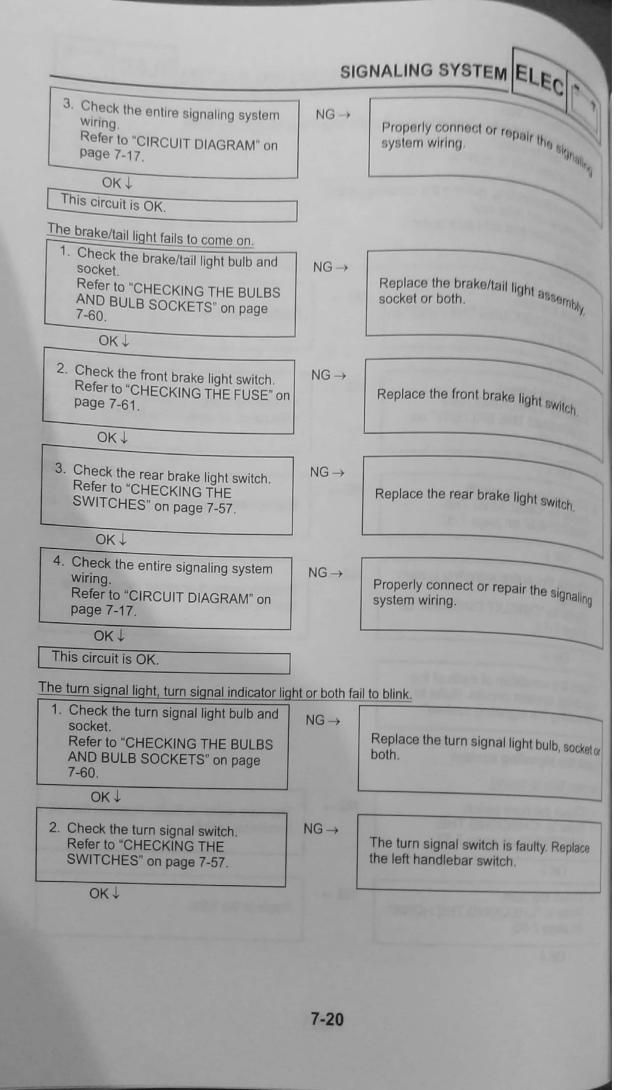
OK ↓

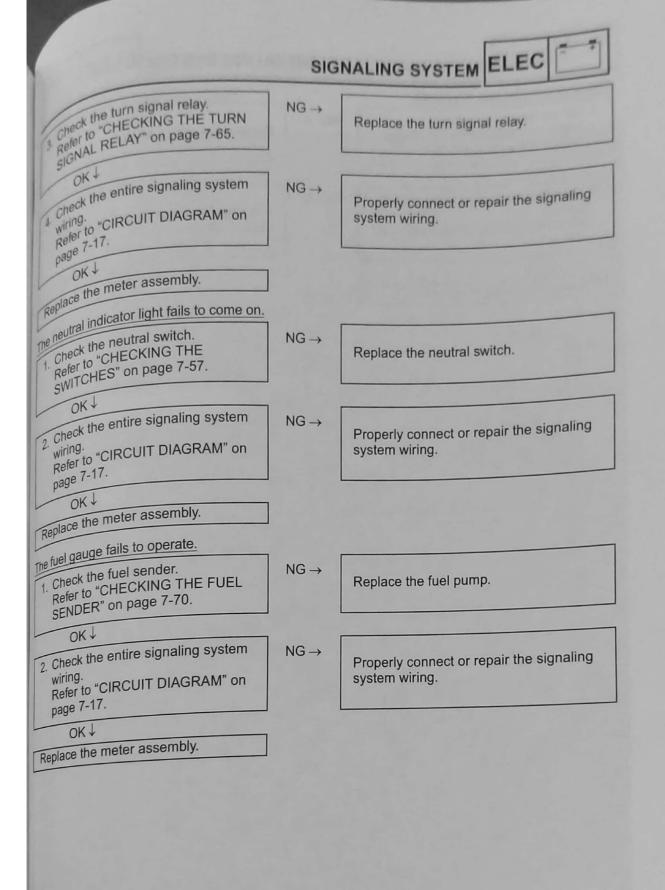
This circuit is OK.



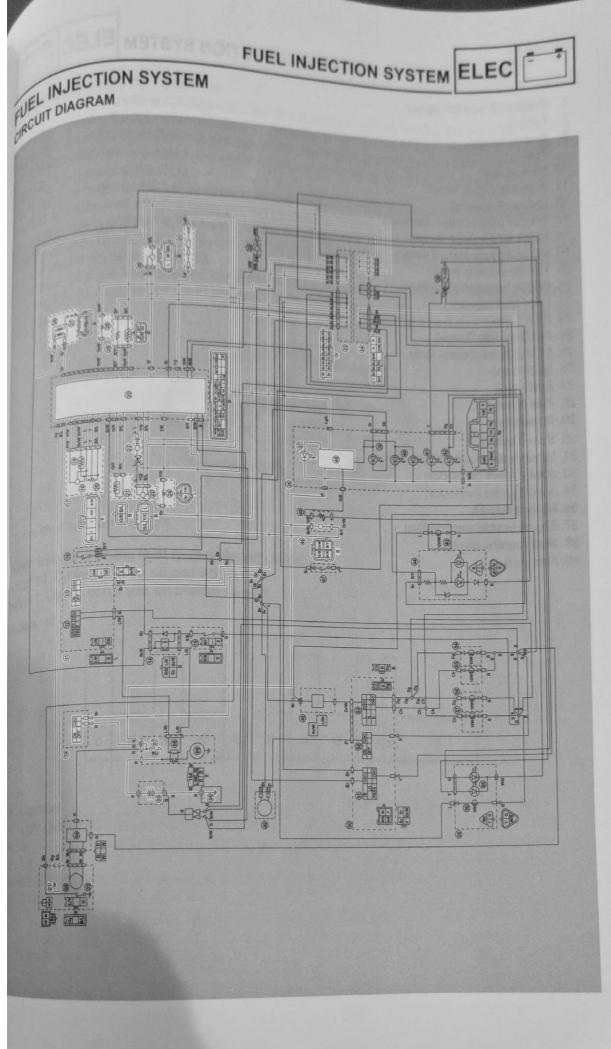
- 3. Neutral switch
- 5. Battery
- 6. Engine ground
- 7. Fuse
- 10. Main switch
- 16. Front brake light switch
- 23. Joint 1
- 25. ECU (Engine Control Unit)
- 30. Speed sensor
- 31. Yamaha diagnostic tool coupler
- 33. Joint 2 (Joint connector)
- 34. Joint 3 (Joint connector)
- 36. Meter assembly
- 38. Multi-function display
- 39. Neutral indicator light
- 42. Turn signal indicator light
- 44. Brake/tail light
- 45. Fuel sender
- 47. Rear brake light switch
- 48. Turn signal relay
- 49. Horn
- 50. Left handlebar switch
- 52. Horn switch
- 53. Turn signal switch
- 54. Rear turn signal light (right)
- 55. Rear turn signal light (left)
- 56. Front turn signal light (right)
- 57. Front turn signal light (left)

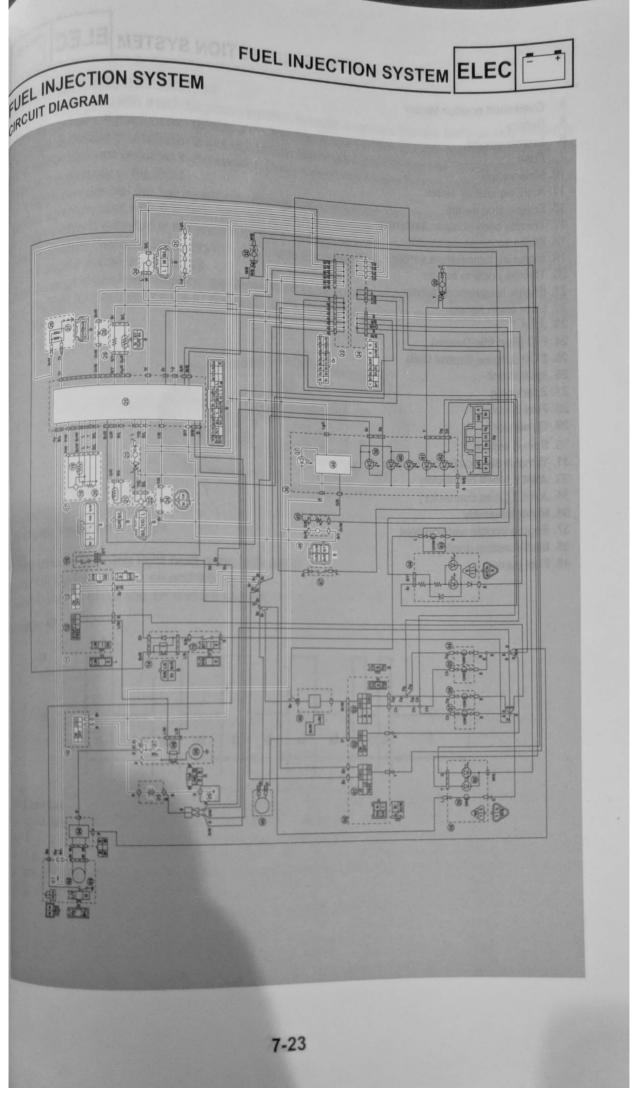




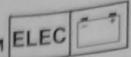


# SIGNALING SYSTEM ELEC The speedometer fails to operate. Check the speed sensor. Refer to "CHECKING THE FUEL SENDER" on page 7-70. $NG \rightarrow$ Replace the speed sensor. OK↓ 2. Check the entire signaling system Properly connect or repair the signaling wiring. $NG \rightarrow$ Refer to "CIRCUIT DIAGRAM" on page 7-17. OK↓ Replace the meter assembly. 7-22





- 1. Crankshaft position sensor
- 5. Battery
- 6. Engine ground
- 7. Fuse
- 10. Main switch
- 11. Right handlebar switch
- 13. Engine stop switch
- 17. Throttle body position assembly
- 18. Intake air pressure sensor
- 19. Intake air temperature sensor
- 20. Throttle position sensor
- 21. Engine temperature sensor
- 22. Lean angle sensor
- 23. Joint 1
- 24. FID (Fast Idle Device)
- 25. ECU (Engine Control Unit)
- 26. Ignition coil
- 27. Spark plug
- 28. Fuel injector
- 29. O<sub>2</sub> sensor
- 30. Speed sensor
- 31. Yamaha diagnostic tool coupler
- 33. Joint 2 (Joint connector)
- 34. Joint 3 (Joint connector)
- 36. Meter assembly
- 37. Engine trouble warning light
- 38. Multi-function display
- 46. Fuel pump



SELF-DIAGNOSTIC FUNCTION SELF-Diagnostic function in order to ensure that the fuel injection system is a specific characteristics and the system in the system. The ECU is equipped in the function detects a malfunction in order to ensure that the fuel injection system is a normally. If this function detects a malfunction in the system, it immediately operates the engine trouble management of the system. not relating normally adjusted a malfunction in the system, it immediately operates the engine trouble warning light to alert the rider malfunction has occurred in the system. Once a malfunction has occurred in the system. and illuminates the engine trouble warning light to alert the rider and in the memory of the ECU.

And in the memory of the total injection and income a malfunction has been detected, a fault code is not a fire the memory of the ECU.

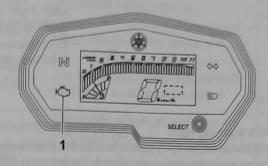
in the rider that the fuel injection system is not functioning, the engine trouble warning light To inform the start switch is being pushed to start the engine.

pushed to start the engine.

Mashes when the detected in the system by the self-diagnostic function, the ECU provides an approif a malfunction is the adviser by the self-diagnostic function, the ECU provides an appropriate substitute characteristic operation, and alerts the rider of the detected malfunction by illuminatine engine trouble warning light.

priate angine trouble warning light. ing the engine has been stopped, the lowest fault code number is indicated by the engine trouble.

After and light (or displayed on the FI diagnostic tool). It remains After the engine to the FI diagnostic tool). It remains stored in the memory of the ECU until warning light. it is deleted.

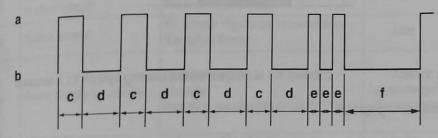


1. Engine trouble warning light

### Engine trouble warning light fault code indication

English of 10: Cycles of 1 sec. on and 1.5 sec. off. Digit of 1: Cycles of 0.5 sec. on and 0.5 sec. off.

Example: 42



- a. Light ON
- b. Light OFF
- c. 1
- d. 1.5

### Engine trouble warning light indication and fuel injection system operation

| Warning light indica- |                                              | Fuel injection opera-                                                                          | Vehicle operation                                     |  |
|-----------------------|----------------------------------------------|------------------------------------------------------------------------------------------------|-------------------------------------------------------|--|
| tion                  | ECU operation                                | tion.                                                                                          |                                                       |  |
| Flashing*             | Warning provided when unable to start engine | Open                                                                                           | Cannot be operated                                    |  |
| Remains on            | Malfunction detected                         | Operated with substitute characteristics in accordance with the description of the malfunction | Can or cannot be operated depending on the fault code |  |

<sup>\*</sup> The warning light flashes when any one of the conditions listed below is present and the start switch is pushed:

| 30: | Lean angle sensor   |
|-----|---------------------|
| 00. | (latch up detected) |

33:

Faulty ignition

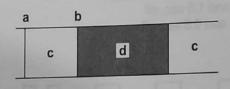
Fuel injector 39: (open or short circuit)

Lean angle sensor (open or short circuit) 41:

ECU internal malfunction (memory check error) 50:

Checking the engine trouble warning light

The engine trouble warning light comes on for 3 seconds after the main switch has been set to "ON". If the warning light does not come on under these conditions, the warning light bulb may be defective.



- a. Main switch "OFF"
- b. Main switch "ON"
- c. Engine trouble warning light off

d. Engine trouble warning light on for 3 seconds

### **SELF-DIAGNOSTIC FUNCTION TABLE**

If the ECU detects an abnormal signal from a sensor while the vehicle is being driven, the ECU illuminates the engine trouble warning light and provides the engine with alternate operating instructions that are appropriate for the type of malfunction.

When an abnormal signal is received from a sensor, the ECU processes the specified values that are programmed for each sensor in order to provide the engine with alternate operating instructions that enable the engine to continue to operate or stop operating, depending on the conditions.

### FUEL INJECTION SYSTEM

Function table

|   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | - | - |
|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---|---|
| ñ | ELEC                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | - | 7 |
| ١ | Name Annual Annu | - | _ |

| de No. | Item                                                        | Symptom                                                                                                                                         | Able/unable<br>to start           | Able/unable<br>to drive                                                           |
|--------|-------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------|-----------------------------------------------------------------------------------|
| 151    | Crankshaft position sensor                                  | No normal signals are received from the crankshaft position sensor.                                                                             | Unable                            | Unable                                                                            |
| 12     | Intake air pressure sensor (open or short circuit)          | No normal signals are received from intake air pressure sensor.                                                                                 | Able                              | Able                                                                              |
| 13     | Intake air pressure sensor<br>1 (clogged hole)              | Defective throttle body (clogged sensor hole or detached sensor).  Defective intake air system (stable pressure is not supplied to the sensor). | Able                              | Able                                                                              |
| 15     | Throttle position sensor (Open or short circuit)            | No normal signals are received from the throttle position sensor.                                                                               | Able (depending on circumstances  | Able (depending on circumstances)                                                 |
| 16     | Throttle position sensor (Stuck)                            | Stuck throttle position sensor detected.                                                                                                        | Able                              | Able                                                                              |
| -0     | Intake air temperature<br>sensor (open or short<br>circuit) | No normal signals are received from the intake air temperature sensor.                                                                          | Able                              | Able                                                                              |
|        | O <sub>2</sub> sensor (not activated)                       | No normal signals are received from the $O_2$ sensor.                                                                                           | Able                              | Able                                                                              |
| 28     | Engine temperature<br>sensor (open or short<br>circuit)     | No normal signals are received from the engine temperature sensor.                                                                              | Able                              | Able                                                                              |
| _      | Lean angle sensor (latch up detected)                       | Latch up detected.                                                                                                                              | Unable                            | Unable                                                                            |
|        | Injector (open circuit)                                     | No normal signals are received from the injector.                                                                                               | Unable                            | Unable                                                                            |
| 41     | Lean angle sensor (open or short circuit)                   | No normal signals are received from the lean angle sensor.                                                                                      | Unable                            | Unable                                                                            |
|        | Speed sensor                                                | No normal signals are received from the speed sensor.                                                                                           | Able                              | Able                                                                              |
|        | Power supply to vehicle                                     | Rectifier/regulator is not operating properly. Battery is not charged properly.                                                                 | Able (depending on circumstances) | <without<br>battery&gt;<br/>Able<br/>(depending or<br/>circumstances</without<br> |
| 50     | Faulty ECU memory                                           | Defective ECU internal memory.                                                                                                                  | Unable                            | Unable                                                                            |
| 70     | Engine has been left idling                                 | Engine idling stop.                                                                                                                             | Able                              | Able                                                                              |



### TROUBLESHOOTING METHOD

The engine operation is not normal and the engine trouble warning light comes on.

- 1. Check:
  - · Fault code number
- a. Check the fault code number displayed on the FI diagnostic tool.
- b. Identify the faulty system with the fault code. Refer to "Self-Diagnostic Function table".
- c. Identify the probable cause of the malfunction. Refer to "Diagnostic code table".

Check and repair the probable cause of the malfunction.

| Fault code No.                                                                                                                                                                                                                       | No fault code No.                                                      |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Check and repair. Refer to<br>"TROUBLESHOOTING DETAILS" on page 7-34.<br>Monitor the operation of<br>the sensors and actuators<br>in the diagnostic mode.<br>Refer to "Sensor operation<br>table" and "Actuator<br>operation table". | Check and repair.<br>Refer to "Self-<br>Diagnostic Function<br>table". |

3. Perform Fuel Injection System reinstatement action.

Refer to "Reinstatement method" of table in "TROUBLESHOOTING DETAILS" on page

4. Set the main switch to "OFF" and back to "ON", and then check that no fault code number is displayed.

If fault codes are displayed, repeat steps (1) to (4) until no fault code number is displayed.

5. Erase the malfunction history in the diagnostic mode. Refer to "Sensor operation table (Diagnostic code No. 62)".

Setting the main switch to "OFF" will not erase the malfunction history

The engine operation is not normal but the The engine open arning light does not come

on.

1. Check the operation of the following sen. Check the open in the Diagnostic mode sors and actuators in the Diagnostic mode sors and actuate sors and "Actual Refer to "Sensor operation table" and "Actual Refer to "Actual Refer to "Sensor operation table". ator operation table".

30: Ignition coil

36: Fuel injector

If a malfunction is detected in the sensors or replace all faulty actuators, repair or replace all faulty parts, is no malfunction is detected in the sensors and actuators, check and repair the inner parts of the engine.



AMAHA DIAGNOSTIC TOOL AMAHA DIAC the Yamaha diagnostic tool to identify malfunctions.

model uses about using the Yamaha diagnostic tool, refer to the operation manual that is included the tool.

the tool.

YAMAHA diagnostic tool USB

INS-018 90890-03256

INS-019 90890-03254

realures of the Yamaha diagnostic tool Feetures of the Yamaha diagnostic tool to identify malfunctions quicker than with conventional meth-

by connecting the adapter interface, which is connected to the USB port of a computer, to a vehicle's By connecting the communication cable, you can display information that is necessary for identifying mal-ECU using the maintenance to display on the computer. The displayed information includes the senfunctions and information recorded in the ECU. Functions of the Yamaha diagnostic tool

Fault diagnosis mode: Fault codes recorded on the ECU are read, and the contents are

displayed.

Function diagnostic mode: Check the operation of the output value of each sensor and actuator. Inspection mode:

Determine whether each sensor or actuator is functioning properly.

00 adjustment mode: Adjust the concentration of CO admissions during idling. Monitoring mode: Displays a graph of sensor output values for actual operating

conditions.

Records and saves the sensor output value in actual driving Logging mode:

conditions.

Displays the logging data. View log:

If necessary, the ECU is rewritten using ECU rewrite data provided by ECU rewrite:

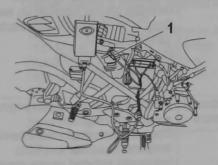
Ignition timing adjustment etc. cannot be changed from the vehicle's

original state.

However, the Diagnostic Tool cannot be used to freely change the basic vehicle functions, such as adjusting the ignition timing.

Connecting the Yamaha diagnostic tool

Disconnect the service tool connector "1", and then connect the Yamaha diagnostic tool to the coupler.



then the Yamaha diagnostic tool is connected to the vehicle, the operation of the multi-function meter indicators will be different from the normal operation.

| Diagr                           | nostic code table                                                                                                                              |                                                                                                                                                                                                                                                       |                   |
|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|
| Fau<br>code !<br>(met<br>displi | It<br>No.<br>er Symptom                                                                                                                        | Probable cause of malfunction                                                                                                                                                                                                                         | Diagnos<br>Code N |
|                                 |                                                                                                                                                | -Open or short circuit in wire harness between crankshaft position sensor and ECUImproperly installed crankshaft position sensorMalfunction in AC magneto rotorDefective crankshaft position sensorMalfunction in ECU.                                | //                |
| 13                              | No normal signals are received from intake air pressure sensor.                                                                                | -Defective coupler between sensor module and ECUOpen or short circuit in wire harness between sensor module and ECUDefective intake air pressure sensorMalfunction in ECU.                                                                            | d03               |
| 14                              | Defective throttle body (clogged sensor hole or detached sensor). Defective intake air system (stable pressure is not supplied to the sensor). | -Sensor module is detachedImproperly installed throttle bodyIntake air pressure sensor hole is clogged.                                                                                                                                               | d03               |
| 15                              | No normal signals are received from the throttle position sensor.                                                                              | -Defective coupler between sensor module and ECUOpen or short circuit in wire harness between sensor module and ECUImproperly installed sensor moduleDefective throttle position sensorMalfunction in ECU.                                            | d01               |
| 16                              | Stuck throttle position sensor detected.                                                                                                       | -Improperly installed sensor moduleDefective throttle position sensorFaulty mechanical connection between throttle position sensor and throttle bodyMalfunction in ECU.                                                                               | d01               |
| 22                              | from the intake air temperature sensor.                                                                                                        | -Defective coupler between sensor module and ECUOpen or short circuit in wire harness between sensor<br>module and ECU.<br>-Improperly installed sensor module.<br>-Defective intake air temperature sensor.<br>-Malfunction in ECU.                  | d05               |
|                                 | from the O <sub>2</sub> sensor.                                                                                                                | Improperly installed $O_2$ sensor.  Defective coupler between $O_2$ sensor and ECU.  Open or short circuit in wire harness between $O_2$ sensor and ECU.  Incorrect fuel pressure.  Defective $O_2$ sensor.  Malfunction in ECU.                      |                   |
|                                 | from the engine temperature sensor.  -( -1 -1 -1 -1                                                                                            | Defective coupler between engine temperature sensor and ECU. Open or short circuit in wire harness between engine temperature sensor and ECU. mproperly installed engine temperature sensor. Defective engine temperature sensor. Malfunction in ECU. | d11               |

### **FUEL INJECTION SYSTEM**

| ۰ |      |     |
|---|------|-----|
| ı | FIEC | - + |
|   | ELEC |     |

| Fault<br>code No.<br>(meter<br>display | Symptom                                                                                                                             | Probable cause of malfunction                                                                                                                                                         | Diagnostic<br>Code No. |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|
| 30                                     | Latch up detected.  -The vehicle has overturnedImproperly installed lean angle sensorDefective lean angle sensorMalfunction in ECU. |                                                                                                                                                                                       | 80b                    |
| 39                                     | No normal signals are received from the injector.                                                                                   | -Defective coupler between injector and ECUOpen or short circuit in wire harness between injector and ECUImproperly installed injector (primary)Defective injectorMalfunction in ECU. | d36<br>d39             |
| 41                                     | No normal signals are received from the lean angle sensor.                                                                          | -Open or short circuit in wire harness between lean angle sensor and ECUDefective lean angle sensorMalfunction in ECU.                                                                | d08                    |
| 42                                     | No normal signals are received from the speed sensor.                                                                               | -Open or short circuit in wire harness between speed sensor and ECUDefective speed sensorMalfunction in ECU.                                                                          | d07                    |
| 46                                     | Rectifier/regulator is not operating properly. Battery is not charged properly.                                                     | yBattery overcharging (broken or disconnected lead in                                                                                                                                 |                        |
| 50                                     | Defective ECU internal memory.                                                                                                      | -Malfunction in ECU.                                                                                                                                                                  | _                      |
| 70                                     | Engine idling stop.                                                                                                                 | This is not a malfunction.                                                                                                                                                            | _                      |

### Diagnostic Code : Sensor operation table

| Diagnostic code No. | Item                | Meter display or Actuation                                                                                                                                                                                                                                             | Checking method                                                                                                                                   |
|---------------------|---------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| D01                 | Throttle angle      | 0–125 Fully closed position: 13–21 Fully open position: 92–102                                                                                                                                                                                                         | Displays the throttle angleCheck the fully closed position                                                                                        |
| D03                 | Intake air pressure | 0–126 [kPa] When engine is stopped: Displays the atmospheric pressure. 0 m (0 ft) above sea level: Approx. ⊠ 101 kPa (757.6 mmHg, 29.8 inHg) 3000 m (9800 ft) above sea level: Approx. 70 kPa (525.0 mmHg, 20.7 inHg) When engine is cranking: Displayed data changes. | Displays the intake air pressure -Check the intake manifold pressurePush the engine start switch, and check that the intake air pressure changes. |

|                     |                                    | atlon                                                                                                                                                                                                   | Checking method                                                                                                                                                                             |
|---------------------|------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Diagnost<br>code No | lc Item                            | Meter display or Actuation                                                                                                                                                                              | Displays the intake air                                                                                                                                                                     |
| D05                 | Intake air temperatur              | close to the ambient temperature is Warm engine: Displayed temperature is approximately 20 degrees higher than the ambient temperature.                                                                 | -Check the temperature inside the intake manifold or air fills case.                                                                                                                        |
| D07                 | Vehicle speed pulses               | 0–999 [pulse] Rear wheel is stopped: Check that the cumulative pulse value does not increase. Rear wheel is rotated several turns by hand: Check that the cumulative pulse value increases.             | of the vehicle speed pulses.  Displays the lean angle sens output voltage.                                                                                                                  |
| D08                 | Lean angle sensor                  | 0-5.0 [V]<br>Upright: 0.4-1.4 [V]<br>Overturned: 3.7-4.4 [V]                                                                                                                                            |                                                                                                                                                                                             |
| D09                 | Battery voltage                    | Overturned. 3.7 4.1 [7]  0–18.7 [V]  Standard data: Approx. 12 [V]                                                                                                                                      | Displays the fuel system voltage (battery voltage).                                                                                                                                         |
| D11                 | Enginé temperature                 | -30 to 150 degrees Cold engine: Displayed temperature is closed to the ambient temperature. (Minimum displayed temperature: -30 degrees) Warm engine: Displays the engine temperature. (Example: 60–100 | Displays the engine temperatureCheck the engine temperature.                                                                                                                                |
| D61                 | Malfunction history code display   | 00: No history Other code: Fault code number (Refer to the fault code table.).                                                                                                                          | Displays the fault code number. If more than one code number is detected, the display alternates every two second to show all the detected coonumbers.                                      |
|                     | Malfunction history code erasure   | Other code: Displays the total number of malfunctions. To erase the history, set the engine stop switch from "OFF" to "ON".                                                                             | Displays the total number of malfunctions, including the current malfunction, that has occurred since the history wast erased.  Erases the malfunction history was the malfunction history. |
| D70 C               | Control number                     | 0–254 [–]                                                                                                                                                                                               | Check the control number.                                                                                                                                                                   |
| D87 A               | VF control learning<br>ata erasure | A/F control learning data has been erased. 01 A/F control learning data has not been erased.                                                                                                            | A/F control learning data<br>erasure condition displayed<br>A/F control learning data<br>erasure                                                                                            |
|                     |                                    | To erase the A/F control learning data, click "Actuator Check" on the Yamaha diagnostic tool screen 3 times in 5 seconds.                                                                               |                                                                                                                                                                                             |

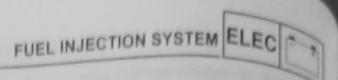


pulgnostic Code : Actuator operation table of the state of th

| pray out.)                          | Item                   | Meter display or Actuation                                                                                                                                             | Checking method                                                                          |
|-------------------------------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|
| propostic<br>ningnostic<br>code No. | ignition coil #1       | Actuates ignition coil #1 five times at one-second intervals.  Illuminates the engine trouble warning light, or indicator lights in the display of YDT turn on.        | Check ignition coil #1 for continuity. Check that a spark is generated.                  |
|                                     | injector #1            | NOTICE                                                                                                                                                                 | Check injector #1 for                                                                    |
| D36                                 | ""                     | Before operating this step, remove fuel pump coupler.                                                                                                                  | continuity.  Check the injector operation by listening for the operating                 |
|                                     |                        | Actuates injector #1 five times at one-<br>second intervals,<br>Illuminates the engine trouble warning<br>light, or indicator lights in the display of<br>YDT turn on. | operation visually.                                                                      |
| D54                                 | FID (Fast Idle Device) | Actuates the FID (Fast Idle Device)                                                                                                                                    | Check the FID (Fast Idle Device) solenoid opertion by listening for the operation sound. |

nunicating error with the FI diagnostic tool

| Communicating error with | Symptom                                                             | Probable cause of malfunction                                                                                                                                   |
|--------------------------|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Er-1                     | No signals are received from the ECU.                               | -Defective coupler between service tool and ECUOpen or short circuit in wire harness between service tool and ECUMalfunction in service toolMalfunction in ECU. |
| Er-2                     | No signals are received from the ECU within the specified duration. | -Defective coupler between service tool and ECUOpen or short circuit in wire harness between service tool and ECUMalfunction in service toolMalfunction in ECU. |
| Er-3                     | Data from the ECU cannot be received correctly.                     | -Defective coupler between service tool and ECUOpen or short circuit in wire harness between service tool and ECUMalfunction in service toolMalfunction in ECU. |
| Er-4                     | No signals are received from the meter.                             | -Defective coupler between service tool and ECUOpen or short circuit in wire harness between service tool and ECUMalfunction in service toolMalfunction in ECU. |



TROUBLESHOOTING DETAILS

This section describes the measures per fault code number displayed on the FI diagnostic tool. Characteristics are the probable cause of the malfunction following to the probable cause of the This section describes the measures per fault code number display.

This section describes the measures per fault code number display.

This section describes the measures per fault code number display.

This section describes the measures per fault code number display.

This section describes the measures per fault code number display.

given.

After the check and service of the malfunctioning part have been completed, reset the FI diagnostic live display according to the reinstatement method.

Fault code No.

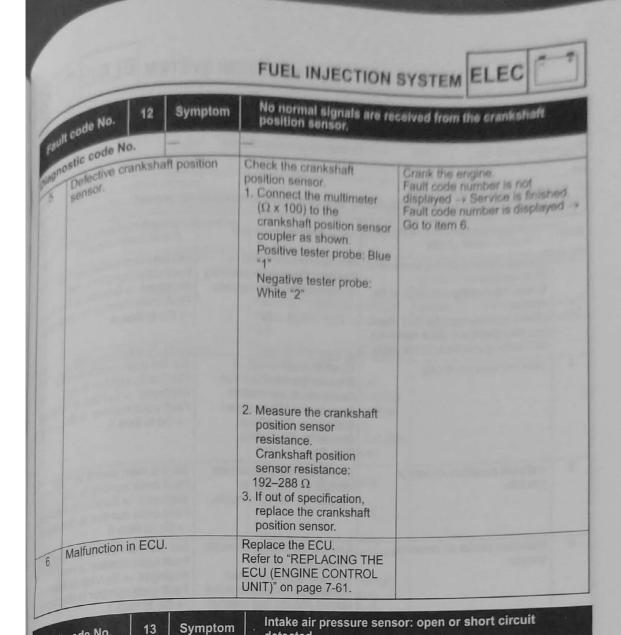
Fault code No.:
Fault code number displayed on the FI diagnostic tool when the engine failed to work normally. Ref. to "Diagnostic code table".

Diagnostic code No.:

Diagnostic code No.:

Diagnostic code number to be used when the diagnostic mode is operated. Refer to "Sensor operation" table" and "Actuator operation table".

| Fau   | It code No.                                                                                                  | 12                                 | Symptom                             | No normal signals are re position sensor.                                                                                         | eceived from the crankshaft                                                                                                |
|-------|--------------------------------------------------------------------------------------------------------------|------------------------------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------|
| Diagn | ostic code No                                                                                                | 0.                                 |                                     |                                                                                                                                   |                                                                                                                            |
| Item  | m Probable cause of malfunctio                                                                               |                                    |                                     | Maintenance job                                                                                                                   | Confirmation of service completion                                                                                         |
| 1     | Connection position sen Check the lot the coupler. Disconnect to check the piterminals an of the pins).      | sor co<br>ocking<br>the couns (be  | upler.<br>condition of<br>upler and | Improperly connected → Connect the coupler securely or replace the wire harness.                                                  | Crank the engine. Fault code number is not displayed → Service is finished Fault code number is displayed. Go to item 2.   |
| 2     | Connection of ECU coupler. Check the lot the coupler. Disconnect to check the pirterminals and of the pins). | r.<br>cking o<br>he cou<br>ns (ber | pler and                            | Improperly connected → Connect the coupler securely or replace the wire harness.                                                  | Crank the engine. Fault code number is not displayed → Service is finished. Fault code number is displayed. Go to item 3.  |
| 3     |                                                                                                              |                                    |                                     | Open or short circuit → Replace the wire harness. Between crankshaft position sensor coupler and ECU coupler. Red–Red White–White | Crank the engine. Fault code number is not displayed → Service is finished. Fault code number is displayed - Go to item 4. |
| 4     | Installed conc<br>position sense<br>Check for loos<br>pinching.<br>Check clearar<br>between sens             | or.<br>seness<br>nce (0.           | s or                                | Improperly installed sensor → Reinstall the crankshaft position sensor.                                                           | Crank the engine. Fault code number is not displayed → Service is finished. Fault code number is displayed - Go to item 5. |



| Fal           | ult code No.                                                                                                                                            |                                               | detected.                                                                        |                                                                                                                                       |  |
|---------------|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|----------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--|
|               | ostic code No.:                                                                                                                                         | d03                                           | Intake air pressure sensor                                                       |                                                                                                                                       |  |
| _             |                                                                                                                                                         |                                               |                                                                                  |                                                                                                                                       |  |
| TIP<br>Do not | t remove the sensor                                                                                                                                     | module.<br>are both indicat                   | ed, take the actions specified fo                                                | r fault code No. 13 first.                                                                                                            |  |
| Item          | Probable cause of and ch                                                                                                                                | f malfunction                                 | Maintenance job                                                                  | Confirmation of service completion                                                                                                    |  |
| 1             | Connection of sens coupler. Check the locking coupler. Disconnect the coupler the pins (bent or broand locking conditions)                              | ondition of the pler and check oken terminals | Improperly connected → Connect the coupler securely or replace the wire harness. | Set the main switch to "ON". Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 2. |  |
| 2             | Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals |                                               | Improperly connected → Connect the coupler securely or replace the wire harness. | Set the main switch to "ON". Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 3. |  |

and locking condition of the pins).

|                          |                                                                                                                                                                                                                                                                 |       |                          | FUEL INJECTION S                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|--------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| CHECK!                   | ult code No.                                                                                                                                                                                                                                                    | 13    | Symptom                  | detected.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Diagr                    | nostic code No.:                                                                                                                                                                                                                                                |       | d03                      | Intake air pressure sensor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| TIP<br>Do no<br>If fault | t remove the sen                                                                                                                                                                                                                                                | sor m | odule.<br>re both indica | ted, take the actions specified fo                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | or fault code No. 13 first.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Item                     | Probable caus                                                                                                                                                                                                                                                   | se of | malfunction              | Maintenance job                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | completion of service                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 3                        | Connection of sub-wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins). Wire harness continuity.  Installed condition of sensor module. |       |                          | Improperly connected → Connect the coupler securely or replace the wire harness.                                                                                                                                                                                                                                                                                                                                                                                                                              | Set the main switch to "ON"<br>Fault code number is not<br>displayed → Service is finish<br>Fault code number is display<br>→ Go to item 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| 4                        |                                                                                                                                                                                                                                                                 |       |                          | Open or short circuit → Replace the wire harness. Between sensor module coupler and ECU coupler. Black/blue—Black/blue Pink/white—Pink/white Blue-Blue                                                                                                                                                                                                                                                                                                                                                        | Set the main switch to "ON" Fault code number is not displayed → Service is finish Fault code number is display → Go to item 5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 5                        |                                                                                                                                                                                                                                                                 |       |                          | Improperly installed sensor module → Reinstall or replace the sensor module.                                                                                                                                                                                                                                                                                                                                                                                                                                  | Set the main switch to "ON" Fault code number is not displayed → Service is finish Fault code number is display → Go to item 6.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                          |                                                                                                                                                                                                                                                                 |       |                          | Execute the diagnostic mode. (Code No. d:03) When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated. At sea level: Approx. 101 kPa 1000 m above sea level: Approx. 90 kPa 2000 m above sea level: Approx. 80 kPa 3000 m above sea level: Approx. 70 kPa When engine is cranking: Make sure that the indication value changes. The value does not change when engine is cranking. → Replace the throttle body. Refer to "REMOVING THE THROTTLE BODY" on page | Set the main switch to "ON". Fault code number is not displayed → Service is finish Fault code number is display → Go to item 7.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| , 0                      | Influentian in ECI                                                                                                                                                                                                                                              |       |                          | 6-7.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Constitution of the Consti |

Replace the ECU. Refer to "REPLACING THE ECU (ENGINE CONTROL UNIT)" on page 7-61.

Malfunction in ECU.

### FUEL INJECTION SYSTEM ELEC Fault code No. Intake air pressure sensor malfunction (clogged hole or Symptom 14 loose sensor). nostic code No.: Intake air pressure sensor d03 on of remove the sensor module. remove the serior module. The serior module indicated, take the actions specified for fault code No. 13 first. probable cause of malfunction Confirmation of service Maintenance job completion Installed condition of sensor. Check the mounting section Start the engine and let it idle for for loose or pinched approximately 5 seconds. mounting. Fault code number is not displayed $\rightarrow$ Service is finished. Refer to "THROTTLE BODY, Fault code number is displayed FUEL INJECTOR" on page 6-7 → Proceed to the next item. Defective intake air pressure Execute the diagnostic mode. (Code No. d:03) sensor. When engine is stopped: Atmospheric pressure at the current altitude and weather conditions is indicated. At sea level: Approx. 101 kPa 1000 m above sea level: Approx. 90 kPa 2000 m above sea level: Approx. 80 kPa 3000 m above sea level: Approx. 70 kPa When engine is cranking: Make sure that the indication value changes. The value does not change when engine is cranking. →

Replace the throttle body.

|       |                                                                                                                                      |                        |                                                                   | FUEL INJECTION                                                                                                                                                                                                                                                                                    | SYSTEM ELEC                                                                                                                             |
|-------|--------------------------------------------------------------------------------------------------------------------------------------|------------------------|-------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------|
|       | Fault code No.                                                                                                                       | 15                     | Sympton                                                           | Throttle position senso                                                                                                                                                                                                                                                                           | r: open or short circuit detected                                                                                                       |
| Dia   | gnostic code No.                                                                                                                     | Rent C                 | d01                                                               | Throttle position sensor                                                                                                                                                                                                                                                                          | detected                                                                                                                                |
| TIP   |                                                                                                                                      |                        |                                                                   |                                                                                                                                                                                                                                                                                                   |                                                                                                                                         |
| Doi   | not remove the sens                                                                                                                  | or mo                  | dule.                                                             |                                                                                                                                                                                                                                                                                                   |                                                                                                                                         |
| Iter  |                                                                                                                                      | e of r                 |                                                                   |                                                                                                                                                                                                                                                                                                   | Confirmation of service                                                                                                                 |
| 1     | Connection of secoupler. Check the locking coupler. Disconnect the coupler the pins (bent or and locking conditions)                 | g con                  | dition of the rand check in terminals                             |                                                                                                                                                                                                                                                                                                   | Fault code number is not displayed → Service is finished → Go to item 2.                                                                |
| 2     | Connection of wir coupler. Check the locking coupler. Disconnect the coupler the pins (bent or band locking conditions)              | conc<br>conc<br>cupler | dition of the and check                                           | Improperly connected → Connect the coupler securely or replace the wire harness.                                                                                                                                                                                                                  | displayed → Service is finished → Go to item 3.                                                                                         |
| 3     | Connection of sub<br>ECU coupler.<br>Check the locking<br>coupler.<br>Disconnect the co<br>the pins (bent or b<br>and locking condit | cond<br>upler<br>roker | harness<br>ition of the<br>and check<br>a terminals<br>the pins). | Improperly connected → Connect the coupler securely or replace the wire harness.                                                                                                                                                                                                                  | displayed → Service is finished. Fault code number is displayed → Go to item 4.                                                         |
| 4     | Wire harness cont                                                                                                                    | inuity                 |                                                                   | Open or short circuit → Replace the wire harness. Between sensor module coupler and ECU coupler. Black/blue–Black/blue Yellow–Yellow Blue-Blue                                                                                                                                                    | Set the main switch to "ON".  Fault code number is not displayed → Service is finished.  Fault code number is displayed → Go to item 5. |
|       | Installed condition module.                                                                                                          |                        |                                                                   | Improperly installed sensor module → Reinstall or replace the sensor module. Refer to "THROTTLE BODY, FUEL INJECTOR" on page 6-7.                                                                                                                                                                 | Set the main switch to "ON".  Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 6.  |
|       | Defective throttle po                                                                                                                | esition                |                                                                   | Execute the diagnostic mode. (Code No. d01) When throttle is fully closed: A value of 13–21 is indicated. When throttle is fully open: A value of 92–102 is indicated. The indication is outside of these ranges → Replace the throttle body. Refer to "REPLACING THE THROTTLE BODY" on page 6-7. | Set the main switch to "ON". Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 7.   |
| 7   1 | Malfunction in ECU.                                                                                                                  |                        |                                                                   | Replace the ECU.<br>Refer to "REPLACING THE<br>ECU (ENGINE CONTROL<br>JNIT)" on page 7-61.                                                                                                                                                                                                        |                                                                                                                                         |

### FUEL INJECTION SYSTEM ELEC Stuck throttle position sensor detected. Symptom Fault code No. 16 Throttle position sensor nostic code No. d01 of remove the sensor module. probable cause of malfunction Confirmation of service Maintenance job completion Installed condition of sensor. Set the main switch to "ON", and Check for loose mounting, pinched mounting, or hard turn the throttle grip to the fully open, then to the fully closed mounting. Make sure that the mounting position. Fault code number is not position is correct. displayed → Service is finished. Fault code number is displayed → Go to item 2. Defective throttle position sensor. Set the main switch to "ON", and Execute the diagnostic mode. turn the throttle grip to the fully (Code No. d01) open, then to the fully closed When throttle is fully closed: position. A value of 13-21 is Fault code number is not indicated. displayed $\rightarrow$ Service is finished. When throttle is fully open: Fault code number is displayed A value of 92-102 is → Go to item 3. indicated. The indication is outside of these ranges → Replace the throttle body. Refer to "REPLACING THE THROTTLE BODY" on page 6-5. Replace the ECU. Malfunction in ECU. Refer to "REPLACING THE ECU (ENGINE CONTROL UNIT)" on page 7-61. Intake air temperature sensor: open or short circuit Fault code No. Symptom 22 detected. Intake air temperature sensor d05 Diagnostic code No. Make sure that the engine is completely cool before checking the following items. Confirmation of service Probable cause of malfunction Maintenance job completion and check Set the main switch to "ON". Improperly connected $\rightarrow$ Connection of sensor module Fault code number is not Connect the coupler securely displayed → Service is finished. coupler. or replace the wire harness. Check the locking condition of the Fault code number is displayed coupler. → Go to item 2. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins). Set the main switch to "ON". Improperly connected → Connection of wire harness ECU Fault code number is not Connect the coupler securely coupler. displayed → Service is finished. or replace the wire harness. Check the locking condition of the Fault code number is displayed → Go to item 3. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).

| Fa    | ult code No.                                                    | 22      | Symptom       | Intake air temperature so<br>detected.<br>Intake air temperature sensor                                                                                                                                                    | ensor: open or short circuit                                                                                                          |  |
|-------|-----------------------------------------------------------------|---------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--|
| Diagn | nostic code No.                                                 |         | d05           |                                                                                                                                                                                                                            |                                                                                                                                       |  |
| TID   |                                                                 |         |               | before checking the following items.  Confirmation of service completion                                                                                                                                                   |                                                                                                                                       |  |
| Make  | sure that the end                                               | gine is | completely co | ol before criedans                                                                                                                                                                                                         | Confirmation of service                                                                                                               |  |
|       | Probable cau                                                    | on of   | malfunction   | Maintenance job                                                                                                                                                                                                            |                                                                                                                                       |  |
| Item  | Probable cau                                                    | d chec  | k             | tt circuit →                                                                                                                                                                                                               | Set the main switch to "ON" Fault code number is posi-                                                                                |  |
| 3     | Wire harness continuity.  Installed condition of sensor module. |         |               | Open or short circuit → Replace the wire harness. Between intake air temperature sensor coupler and ECU coupler. Black/blue–Black/blue Brown/white-Brown/white                                                             | displayed → Service is finishe Fault code number is displaye → Go to item 4.                                                          |  |
|       |                                                                 |         |               | Check for looseness or pinching. Improperly installed sensor module → Reinstall or replace the sensor module.                                                                                                              | Set the main switch to "ON".  Fault code number is not displayed → Service is finisher Fault code number is displayed → Go to item 5. |  |
| 4     |                                                                 |         |               |                                                                                                                                                                                                                            |                                                                                                                                       |  |
| 5     | Defective intake air temperature sensor.                        |         |               | Execute the diagnostic mode. (Code No. d:05) Cold engine: Displayed temperature is close to the ambient temperature. Incorrect indication → Replace the throttle body. Refer to "REPLACING THE THROTTLE BODY" on page 6-5. | Set the main switch to "ON". Fault code number is not displayed → Service is finished Fault code number is displayed → Go to item 6.  |  |
| 6     | Wallandson in 200                                               |         |               | Replace the ECU. Refer to "REPLACING THE ECU (ENGINE CONTROL UNIT)" on page 7-61.                                                                                                                                          |                                                                                                                                       |  |

### FUEL INJECTION SYSTEM ELEC O2 sensor: Not activated. Symptom 24 Fault code No. nostic code No. probable cause of malfunction and check Confirmation of service Maintenance job completion Installed condition of O<sub>2</sub> sensor. Start the engine, warm it up, and Improperly installed sensor then race it, or execute the → Reinstall or replace the diagnostic mode. (Code No. sensor. d:63) Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 2. Connection of O<sub>2</sub> sensor coupler. Start the engine, warm it up, and Improperly connected → Connection of the Check the locking condition of the then race it, or execute the Connect the coupler securely diagnostic mode. (Code No. or replace the wire harness. Disconnect the coupler and check d:63) Disconnic (bent or broken terminals Fault code number is not displayed $\rightarrow$ Service is finished. the place and locking condition of the pins). Fault code number is displayed → Go to item 3. Start the engine, warm it up, and Connection of wire harness ECU Improperly connected → then race it, or execute the Connect the coupler securely diagnostic mode. (Code No. check the locking condition of the or replace the wire harness. Fault code number is not Disconnect the coupler and check $\mbox{displayed} \rightarrow \mbox{Service is finished}.$ the pins (bent or broken terminals Fault code number is displayed and locking condition of the pins). → Go to item 4. Start the engine, warm it up, and Wire harness continuity. Open or short circuit → then race it, or execute the Replace the wire harness. diagnostic mode. (Code No. Between O2 sensor coupler d:63) and ECU coupler. Fault code number is not Gray/red-Gray/red displayed $\rightarrow$ Service is finished. Brown-Brown Fault code number is displayed Red/Yellow-Red/Yellow → Go to item 5. Black/Blue-Black/Blue Start the engine, warm it up, and Refer to "CHECKING THE Check the fuel pressure. then race it, or execute the FUEL PRESSURE" on page diagnostic mode. (Code No. 6-4. d:63) Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 6. Start the engine, warm it up, and Check the O2 sensor. Defective O<sub>2</sub> sensor. then race it, or execute the Defective → Replace the O<sub>2</sub> diagnostic mode. (Code No. sensor. Refer to "REMOVING THE d:63) Fault code number is not ENGINE" on page 5-1. $\mbox{displayed} \rightarrow \mbox{Service is finished}.$ Fault code number is displayed → Go to item 7. Replace the ECU. Malfunction in ECU Refer to "REPLACING THE ECU (ENGINE CONTROL UNIT)" on page 7-61.

|              |                                                                                                        |          |                                                 | FUEL INJECTION                                                                                                                                                                    | THE RESERVE OF THE PERSON NAMED IN COLUMN TWO IS NOT THE PERSON NAMED IN COLUMN TWO IS NA |
|--------------|--------------------------------------------------------------------------------------------------------|----------|-------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| F            | ault code No.                                                                                          | 28       | Symptom                                         | Engine temperature sen detected.  Engine temperature sensor                                                                                                                       | sor: open or short circuit                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Die          | mantin anda No.                                                                                        |          | d11                                             | Engine tempor                                                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| niač         | gnostic code No.                                                                                       |          |                                                 | s a shecking the followin                                                                                                                                                         | g items.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| TIP .<br>Mak | e sure that the eng                                                                                    | jine is  | completely c                                    | ool before checking the followin                                                                                                                                                  | Confirmation of service                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Iten         | Probable cause of mailuiton                                                                            |          |                                                 |                                                                                                                                                                                   | Set the main switch to "ON" Fault code number is not displayed → Service is finished and the service is displayed → Go to item 2.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| 2            | and locking con Connection of w coupler. Check the lockir coupler. Disconnect the of the pins (bent of | vire har | rness ECU dition of the r and check n terminals | Improperly connected → Connect the coupler securely or replace the wire harness.                                                                                                  | Set the main switch to "ON".  Fault code number is not displayed → Service is finishe Fault code number is displayed → Go to item 3.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 3            | and locking condition of the pins). Wire harness continuity.                                           |          |                                                 | Open or short circuit → Replace the wire harness. Between engine temperature sensor coupler and ECU coupler. Black/blue—Black/blue Green/red—Green/red                            | Set the main switch to "ON". Fault code number is not displayed → Service is finished Fault code number is displayed → Go to item 4.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 4            | Installed condition of engine temperature sensor.                                                      |          |                                                 | Check for looseness or pinching. Improperly installed sensor → Reinstall the sensor.                                                                                              | Set the main switch to "ON". Fault code number is not displayed → Service is finished Fault code number is displayed → Go to item 5.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 5            | Defective engine sensor.                                                                               | tempe    |                                                 | Execute the diagnostic mode. (Code No. d11) Cold engine: Displayed temperature is close to the ambient temperature. Incorrect indication → Replace the engine temperature sensor. | Set the main switch to "ON". Fault code number is not displayed → Service is finished Fault code number is displayed → Go to item 6.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| 3            | Malfunction in ECU.                                                                                    |          |                                                 | Replace the ECU. Refer to "REPLACING THE ECU (ENGINE CONTROL JNIT)" on page 7-61.                                                                                                 | Same of the last o |

## FUEL INJECTION SYSTEM ELEC



| Fault code No. 30              | Symptom               | Latch up detected.                                                                                         |                                                                                                                                                                              |
|--------------------------------|-----------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| cault code                     | d08                   | Lean angle sensor                                                                                          |                                                                                                                                                                              |
| and shie cause of              | of malfunction<br>eck | Maintenance job                                                                                            | Confirmation of service completion                                                                                                                                           |
| The vehicle has over           | erturnea.             | Raise the vehicle upright.                                                                                 | Set the main switch to "ON", then to "OFF", and then back to "ON".  Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 2. |
| Installed condition of sensor. |                       | Check the installed direction and condition of the sensor.                                                 | Set the main switch to "ON", then to "OFF", and then back to "ON".  Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 3. |
| Defective lean angle           | e sensor.             | Execute the diagnostic mode. (Code No. d08) Upright: 0.4–1.4 V Overturned: 3.7–4.4 V Replace if defective. | Set the main switch to "ON", then to "OFF", and then back to "ON". Fault code number is not displayed → Service is finished. Fault code number is displayed → Go to item 4.  |
| Malfunction in ECU.            |                       | Replace the ECU. Refer to "REPLACING THE ECU (ENGINE CONTROL UNIT)" on page 7-61.                          |                                                                                                                                                                              |

|           |                                                                                                                                                                                                 |                                                                                                             |                                      | FUEL INJECTION S                                                                                                                                                                   | SYSTEM ELEC                                                                                                                                                                              |  |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|           | fault code No.                                                                                                                                                                                  | 39                                                                                                          | Symptom                              | Injector: open or short ci                                                                                                                                                         | rcult detected,                                                                                                                                                                          |  |
|           | CONTROLLERS.                                                                                                                                                                                    | and the same                                                                                                | d36-d39                              | Injectors #1-#4                                                                                                                                                                    | Confirmation of service                                                                                                                                                                  |  |
| Dia       | gnostic code No.                                                                                                                                                                                | use of                                                                                                      | -                                    | Maintenance job                                                                                                                                                                    | completion of service                                                                                                                                                                    |  |
| Iter<br>1 | Connection of<br>Check the lock                                                                                                                                                                 | Probable cause of malfunction and check  Connection of injector coupler. Check the locking condition of the |                                      | Improperly connected → Connect the coupler securely or replace the wire harness.                                                                                                   | to item 7.                                                                                                                                                                               |  |
|           | Disconnect the the pins (bent and locking co                                                                                                                                                    | OF DEOK                                                                                                     | Ell (Citimina                        |                                                                                                                                                                                    | operating sound is not heard<br>Go to item 2.                                                                                                                                            |  |
| 2         | Defective injector.                                                                                                                                                                             |                                                                                                             |                                      | Measure the injector resistance. If the resistance is not 12.2 $\Omega$ , replace the injector.                                                                                    | Execute the diagnostic mode. (Code No. d36) Decompression solenoid operating sound is heard to item 7. Decompression solenoid operating sound is not heard Go to item 3.                 |  |
| 3         | Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).     |                                                                                                             |                                      | Improperly connected → Connect the coupler securely or replace the wire harness.                                                                                                   | Execute the diagnostic mode. (Code No. d36) Decompression solenoid operating sound is heard to item 7. Decompression solenoid operating sound is not heard Go to item 4.                 |  |
| 4         | Connection of sub-wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins). |                                                                                                             | dition of the rand check n terminals | Improperly connected → Connect the coupler securely or replace the wire harness.                                                                                                   | Execute the diagnostic mode. (Code No. d36) Decompression solenoid operating sound is heard $\rightarrow$ G to item 7. Decompression solenoid operating sound is not heard Go to item 5. |  |
| 5         | Wire harness continuity.                                                                                                                                                                        |                                                                                                             |                                      | Open or short circuit → Replace the wire harness. Between injector coupler and ECU coupler. Orange/black-Orange/black Between fuel injector coupler and J/C 2. Brown/red—Brown/red | Execute the diagnostic mode. (Code No. d36) Decompression solenoid operating sound is heard → G to item 7. Decompression solenoid operating sound is not heard - Go to item 6.           |  |
| 6         | Malfunction in ECU.                                                                                                                                                                             |                                                                                                             |                                      | Replace the ECU.<br>Refer to "REPLACING THE<br>ECU (ENGINE CONTROL<br>UNIT)" on page 7-61.                                                                                         |                                                                                                                                                                                          |  |
| 7         | Delete the fault o                                                                                                                                                                              | odes.                                                                                                       |                                      | Start the engine and let it idle for approximately 5 seconds. After completing the above operation, check whether a fault code number is displayed.                                |                                                                                                                                                                                          |  |

#### FUEL INJECTION SYSTEM ELEC Lean angle sensor; open or short circuit detected. Symptom 41 I code No. Lean angle sensor d08 etic code No. probable cause of malfunction and check Confirmation of service Maintenance job completion Connection of lean angle sensor Improperly connected -> Set the main switch to "ON" coupler. check the locking condition of the Connect the coupler securely then to "OFF" and then back to or replace the wire harness. "ON" Disconnect the coupler and check Fault code number is not pisconnect the pins (bent or broken terminals the pins (bent or broken terminals displayed -> Service is finished. the pins (condition of the pins). Fault code number is displayed → Go to item 2. Connection of wire harness ECU Improperly connected -> Set the main switch to "ON" then to "OFF" and then back to coupler. Check the locking condition of the Connect the coupler securely or replace the wire harness. "ON" Disconnect the coupler and check Fault code number is not displayed → Service is finished. pisconnect or broken terminals Fault code number is displayed and locking condition of the pins). → Go to item 3. Wire harness continuity. Set the main switch to "ON", Open or short circuit -> then to "OFF" and then back to Replace the wire harness. Between lean angle sensor "ON". Fault code number is not coupler and ECU coupler. displayed → Service is finished. Black/blue-Black/blue Fault code number is displayed Yellow/green-Yellow/green → Go to item 4. Blue-Blue Defective lean angle sensor. Set the main switch to "ON", Check the lean angle sensor. then to "OFF" and then back to Replace if detective. Refer to "CHECKING THE Fault code number is not LEAN ANGLE SENSOR" on displayed → Service is finished. page 7-68. Fault code number is displayed

→ Go to item 5.

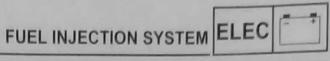
Replace the ECU.

Refer to "REPLACING THE ECU (ENGINE CONTROL UNIT)" on page 7-61.

Malfunction in ECU.

# FUEL INJECTION SYSTEM ELEC

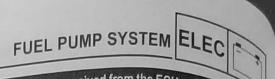
| Fa                      | ault code No.                                                                                              | 42            | Symptom                                                  | No normal signals are re                                                                                                                                                                                                                                                                               | eceived from the speed                                                                                                                                                            |  |
|-------------------------|------------------------------------------------------------------------------------------------------------|---------------|----------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Diagnostic code No. d07 |                                                                                                            |               | d07                                                      | No normal signals are received from the speed s                                                                                                                                                                                                                                                        |                                                                                                                                                                                   |  |
| Item                    | Probable cau                                                                                               | ise of        | malfunction                                              | Maintenance job                                                                                                                                                                                                                                                                                        | Confirmation of                                                                                                                                                                   |  |
| 1                       | Connection of coupler. Check the lock coupler. Disconnect the the pins (bent of and locking corrections)   | speed ing cor | sensor<br>adition of the<br>er and check<br>en terminals | Improperly connected → Connect the coupler securely or replace the wire harness.                                                                                                                                                                                                                       | then rotate the rear wheel several turns by hand. Fault code number is not displayed — Service is finished.                                                                       |  |
| 2                       | Connection of a coupler. Check the locki coupler. Disconnect the the pins (bent of and locking connection) | vire hang con | dition of the r and check on terminals                   | Improperly connected → Connect the coupler securely or replace the wire harness.                                                                                                                                                                                                                       | then rotate the rear wheel several turns by hand. Fault code number is not displayed → Service is finis Fault code number is displayed.                                           |  |
| 3                       | Wire harness co                                                                                            |               |                                                          | Open or short circuit → Replace the wire harness. Between speed sensor coupler and ECU coupler. Blue-Blue White-White Black/blue-Black/blue                                                                                                                                                            | set the main switch to "ON" then rotate the rear wheel several turns by hand. Fault code number is not displayed → Service is finis Fault code number is displayed → Go to item 4 |  |
| 4                       | Defective speed                                                                                            | senso         |                                                          | Check the speed sensor.  → Execute the diagnostic mode. (Code No. d07)  Rear wheel stopped: Check that the cumulative pulse value does not increase.  Rear wheel is rotated several turns by hand: Check that the cumulative pulse value increases.  Incorrect indication →  Replace the speed sensor. | Set the main switch to "ON" then rotate the rear wheel several turns by hand. Fault code number is not displayed → Service is finish Fault code number is display → Go to item 5. |  |
| 5 1                     | Malfunction in EC                                                                                          | CU.           | l l                                                      | Replace the ECU. Refer to "REPLACING THE ECU (ENGINE CONTROL JNIT)" on page 7-61.                                                                                                                                                                                                                      |                                                                                                                                                                                   |  |



| Fau  | It code No.    | 46      | Symptom           | Incorrect voltage is supplied to the ECU.                                                                                                                    |                                                                                                                                                                                          |  |
|------|----------------|---------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
|      | ostic code No. |         |                   |                                                                                                                                                              |                                                                                                                                                                                          |  |
| item | probable ca    | use of  | malfunction<br>ck | Maintenance job                                                                                                                                              | Confirmation of service completion                                                                                                                                                       |  |
| 1    | Malfunction in | chargii | ng system.        | Check the charging system. Refer to "CHARGING SYS- TEM" on page *-**. Check the rectifier/regulator, AC magneto, and wire har- ness. → Replace if defective. | Start the engine and let it idle for approximately 5 seconds. Fault code number is not displayed → Service is finished. Fault code number is displayed → Repeat the procedure in item 1. |  |

| Fault code No. 50 Symptom |                | Faulty ECU memory. |   |                                                                                            |                                                                                 |
|---------------------------|----------------|--------------------|---|--------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------|
| ojagno                    | stic code No.  | Y. Y.              | _ | _                                                                                          |                                                                                 |
| Item                      | Probable car   | _                  |   | Maintenance job                                                                            | Confirmation of service completion                                              |
| 1                         | Malfunction in | ECU                |   | Replace the ECU.<br>Refer to "REPLACING THE<br>ECU (ENGINE CONTROL<br>UNIT)" on page 7-61. | Set the main switch to "ON". Check that the fault code number is not displayed. |

| Fault code No.   Er-1   Symptom |                 |        | Symptom                                                                          | No signals are received fr                                                                                                           | om the ECU.                                                                                                                           |  |
|---------------------------------|-----------------|--------|----------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|--|
| Diagn                           | ostic code No.  |        | _                                                                                |                                                                                                                                      | " " of convice                                                                                                                        |  |
| Item                            | Probable ca     | use of | malfunction                                                                      | Maintenance job                                                                                                                      | Confirmation of service completion                                                                                                    |  |
| 1                               | and check       |        | Improperly connected → Connect the coupler securely or replace the wire harness. | Set the main switch to "ON". Fault code number is not displayed → Service is finished Fault code number is displayed → Go to item 2. |                                                                                                                                       |  |
| 2                               |                 |        | arness ECU<br>ndition of the<br>er and check<br>en terminals                     | Improperly connected → Connect the coupler securely or replace the wire harness.                                                     | Set the main switch to "ON". Fault code number is not displayed → Service is finished Fault code number is displayed → Go to item 3.  |  |
| 3                               | Wire harness    |        |                                                                                  | Open or short circuit → Replace the wire harness. Between meter coupler and ECU coupler. Light green-Light green/Blue                | Set the main switch to "ON".  Fault code number is not displayed → Service is finished Fault code number is displayed → Go to item 4. |  |
| 4                               | Defective meter | er.    |                                                                                  | Replace the meter.                                                                                                                   | Set the main switch to "ON". Fault code number is not displayed → Service is finished Fault code number is displayed → Go to item 5.  |  |
| 5                               | Malfunction in  | ECU.   |                                                                                  | Replace the ECU. Refer to "REPLACING THE ECU (ENGINE CONTROL UNIT)" on page 7-61.                                                    |                                                                                                                                       |  |



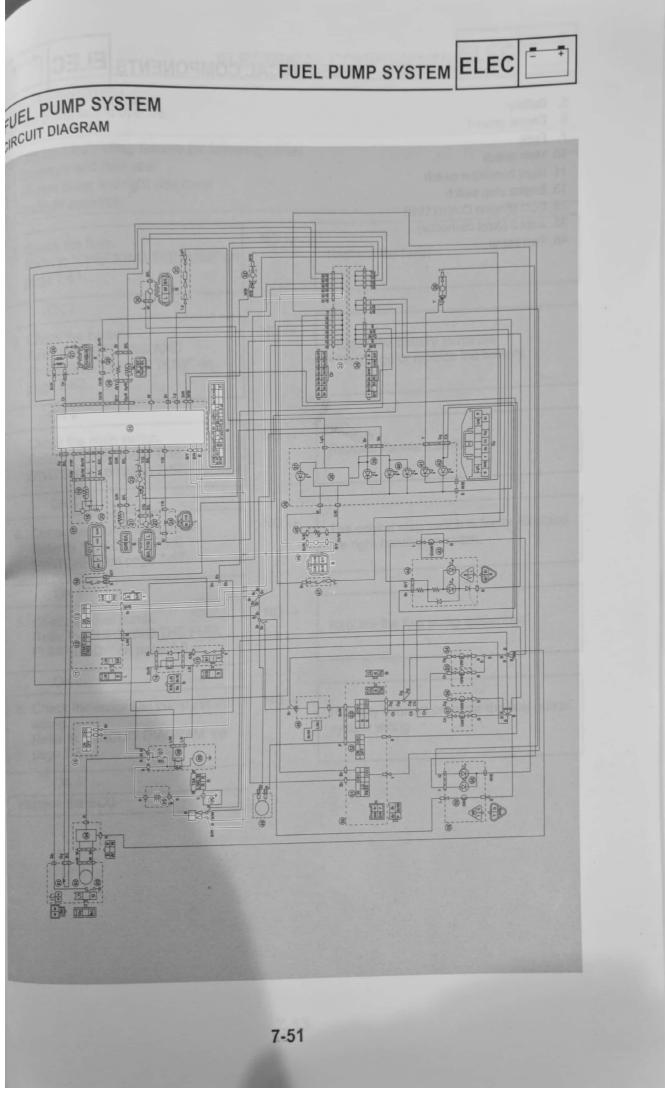
| Fai   | ult code No. Er-2 Symptom                                                                                                                                                                   | duration.                                                                                                             | rom the ECU within the specif                                                                                                     |
|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------|
| Diagn | ostic code No. —                                                                                                                                                                            |                                                                                                                       | Confirmation                                                                                                                      |
| Item  | Probable cause of malfunction                                                                                                                                                               | Maintenance job                                                                                                       | Confirmation of service                                                                                                           |
| 1     | and check  Connection of meter coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins). | Improperly connected → Connect the coupler securely or replace the wire harness.                                      | Fault code number is not displayed → Service is finish → Go to item 2.                                                            |
| 2     | Connection of meter coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins).            | Improperly connected → Connect the coupler securely or replace the wire harness.                                      | Set the main switch to "ON". Fault code number is not displayed → Service is finish Fault code number is display → Go to item 3.  |
| 3     | Wire harness continuity.                                                                                                                                                                    | Open or short circuit → Replace the wire harness. Between meter coupler and ECU coupler. Light green-Light green/Blue | Set the main switch to "ON". Fault code number is not displayed → Service is finish Fault code number is display → Go to item 4.  |
| 4     | Defective meter.                                                                                                                                                                            | Replace the meter.                                                                                                    | Set the main switch to "ON". Fault code number is not displayed → Service is finish Fault code number is display. → Go to item 5. |
| 5     | Malfunction in ECU.                                                                                                                                                                         | Replace the ECU. Refer to "REPLACING THE ECU (ENGINE CONTROL UNIT)" on page 7-61.                                     |                                                                                                                                   |

### FUEL PUMP SYSTEM

| _ | - |
|---|---|
| - | 4 |
|   |   |
| - |   |
|   | - |

| Er-3 Symptom                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Data from the ECU canno                                                                                               | Data from the ECU cannot be received correctly.                                                                                      |  |  |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------|--|--|
| ault code No. Er-3 Symptom                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                                                                       | 100                                                                                                                                  |  |  |
| hable cause of malfunction                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Maintenance job                                                                                                       | Confirmation of service completion                                                                                                   |  |  |
| Connection of meter coupler.  Connection of meter coupler.  Check the locking condition of the coupler.  C | Improperly connected → Connect the coupler securely or replace the wire harness.                                      | Set the main switch to "ON". Fault code number is not displayed → Service is finished Fault code number is displayed → Go to item 2. |  |  |
| connection of meter coupler.  Check the locking condition of the coupler.  Coupler.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Improperly connected → Connect the coupler securely or replace the wire harness.                                      | Set the main switch to "ON". Fault code number is not displayed → Service is finished Fault code number is displayed → Go to item 3. |  |  |
| the pins (bent or broken terminals the pins (bent or broken terminals the pins).  and locking condition of the pins).  Wire harness continuity.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Open or short circuit → Replace the wire harness. Between meter coupler and ECU coupler. Light green-Light green/Blue | Set the main switch to "ON". Fault code number is not displayed → Service is finished Fault code number is displayed → Go to item 4. |  |  |
| Defective meter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Replace the meter.                                                                                                    | Set the main switch to "ON". Fault code number is not displayed → Service is finished Fault code number is displayed → Go to item 5. |  |  |
| Malfunction in ECU.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Replace the ECU. Refer to "REPLACING THE ECU (ENGINE CONTROL UNIT)" on page 7-61.                                     |                                                                                                                                      |  |  |

|                                                                           |                                                                                                                                                                                                                                                                                                                                          |                  |                                                                                                                       | SYSTEM ELEC                                                                                                                                    |  |
|---------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Fault code No.   Er-4   Symptom   No signals are received from the meter, |                                                                                                                                                                                                                                                                                                                                          |                  |                                                                                                                       |                                                                                                                                                |  |
| Diag                                                                      | nostic code No.                                                                                                                                                                                                                                                                                                                          |                  | - Ink                                                                                                                 | Confirmation of service                                                                                                                        |  |
| Item                                                                      | Probable cause of n                                                                                                                                                                                                                                                                                                                      | nalfunction<br>k | Maintenance Job                                                                                                       | Set the main series                                                                                                                            |  |
| 1                                                                         | Connection of meter coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals and locking condition of the pins). Connection of wire harness ECU coupler. Check the locking condition of the coupler. Disconnect the coupler and check the pins (bent or broken terminals |                  | Improperly connected → Connect the coupler securely or replace the wire harness.                                      | displayed → Service is firest<br>Fault code number is displayed → Go to Item 2.                                                                |  |
| 2                                                                         |                                                                                                                                                                                                                                                                                                                                          |                  | Improperly connected → Connect the coupler securely or replace the wire harness.                                      | Set the main switch to "ON-<br>Fault code number is not<br>displayed → Service is finish<br>Fault code number is displaye<br>→ Go to Item 3.   |  |
| 3                                                                         | and locking condition o Wire harness continuity                                                                                                                                                                                                                                                                                          |                  | Open or short circuit → Replace the wire harness. Between meter coupler and ECU coupler. Light green-Light green/Blue | Set the main switch to "ON" Fault code number is not displayed → Service is finishe Fault code number is displaye → Go to item 4.              |  |
| 4                                                                         |                                                                                                                                                                                                                                                                                                                                          |                  | Replace the meter.                                                                                                    | Set the main switch to "ON".<br>Fault code number is not<br>displayed → Service is finishs<br>Fault code number is displaye<br>→ Go to item 5. |  |
| 5                                                                         | Malfunction in ECU.                                                                                                                                                                                                                                                                                                                      |                  | Replace the ECU. Refer to "REPLACING THE ECU (ENGINE CONTROL UNIT)" on page 7-61.                                     |                                                                                                                                                |  |

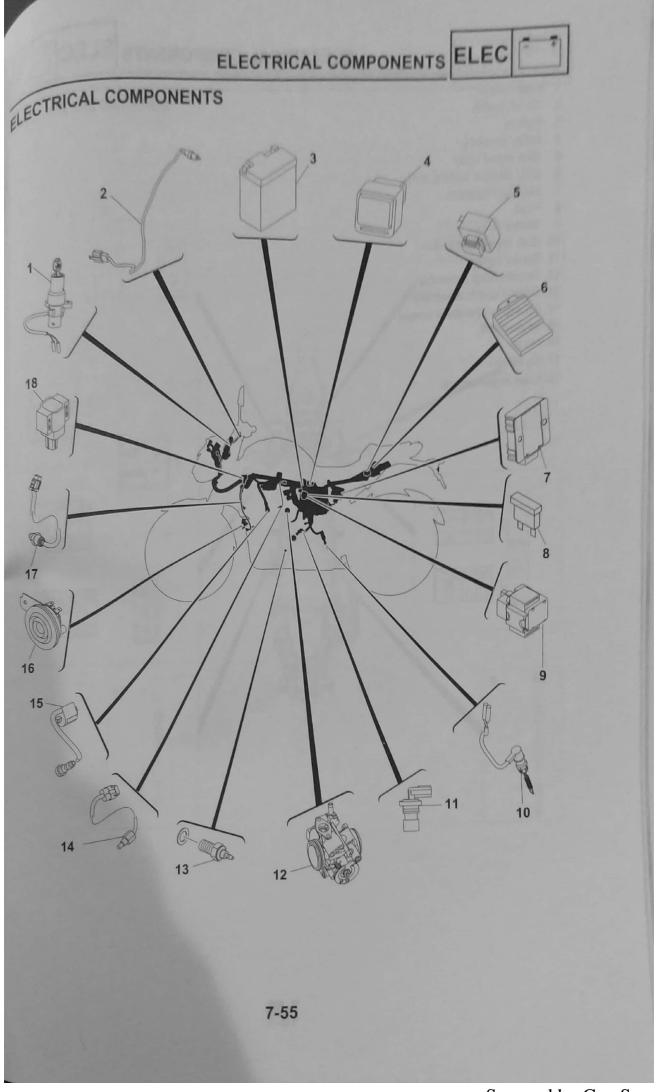






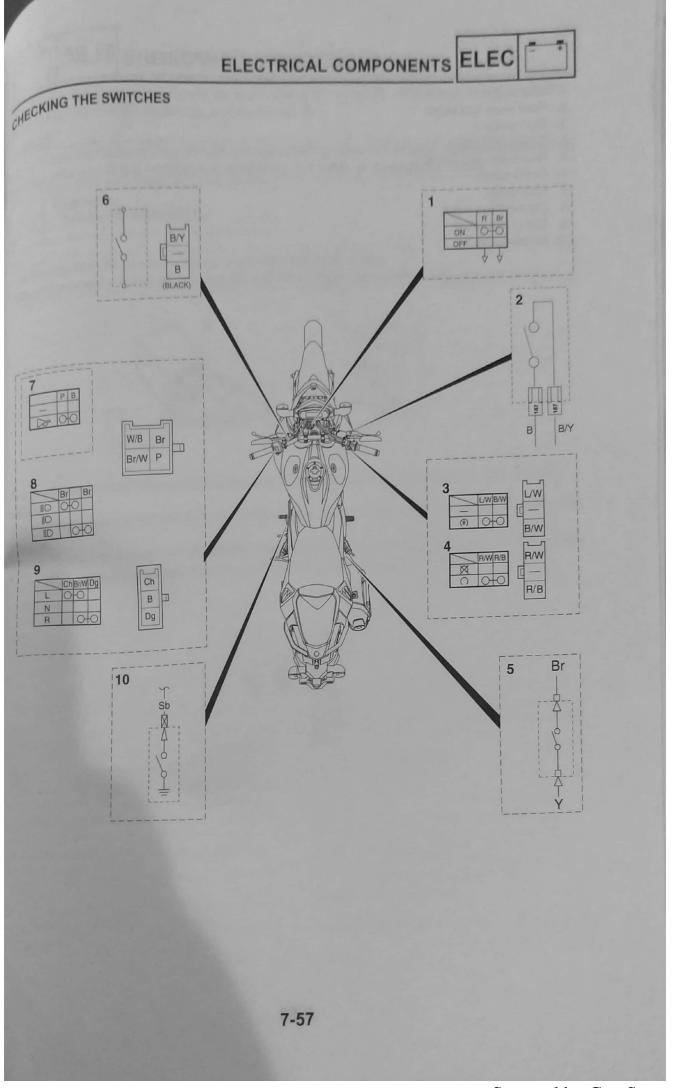
- 5. Battery
- 6. Engine ground
- 7. Fuse
- 10. Main switch
- 11. Right handlebar switch
- 13. Engine stop switch
- 25. ECU (Engine Control Unit)
- 33. Joint 2 (Joint connector)
- 46. Fuel pump

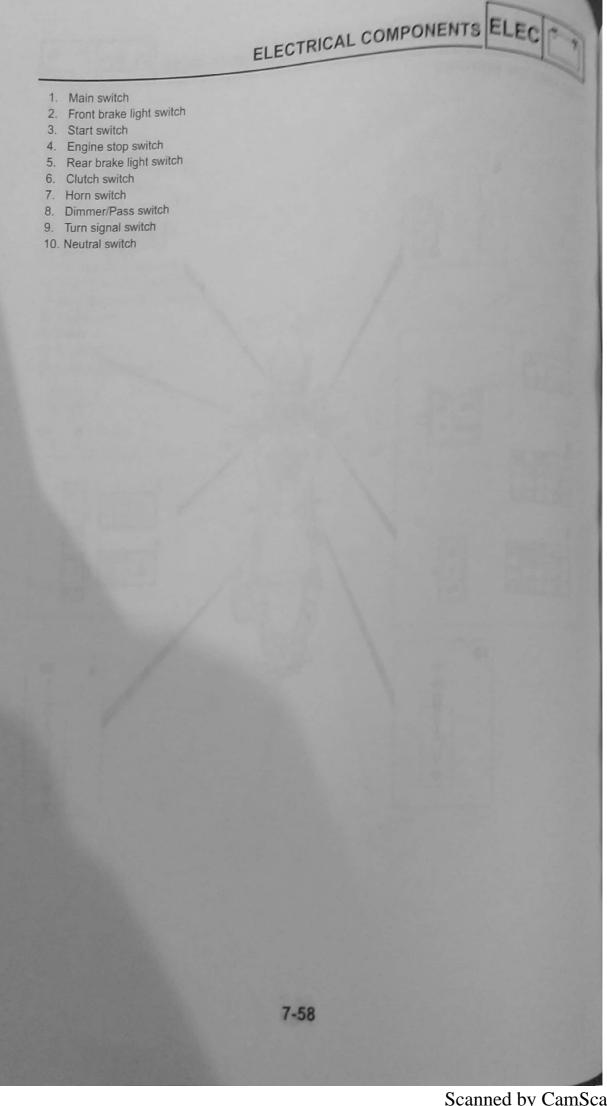
### ELECTRICAL COMPONENTS ELEC ROUBLESHOOTING The fuel pump fails to operate. The troubleshooting, remove the following part(s): Passenger and rider seat Left side cover and right side cover Headlight assembly 1. Check the fuse. $NG \rightarrow$ Refer to "CHECKING THE FUSE" on Replace the fuse. page 7-61. OK↓ 2. Check the battery. $NG \rightarrow$ Clean the battery terminals. Refer to "CHECKING AND Recharge or replace the battery. CHARGING THE BATTERY" on page 7-62. OK ↓ 3. Check the main switch. $NG \rightarrow$ Replace the main switch. Refer to "CHECKING THE SWITCHES" on page 7-57. OK↓ The engine stop switch is faulty. Replace 4. Check the engine stop switch. $NG \rightarrow$ the right handlebar switch. Refer to "CHECKING THE SWITCHES" on page 7-57. OK↓ $NG \rightarrow$ Replace the fuel pump assembly. 5. Check the fuel pump. Refer to "CHECKING THE FUEL PUMP BODY" on page 6-3. OK ↓ 6. Check the entire fuel pump system $NG \rightarrow$ Properly connect or repair the fuel pump system wiring. Refer to "CIRCUIT DIAGRAM" on page 7-51. OK↓ Replace the ECU.

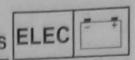


# ELECTRICAL COMPONENTS ELEC

- 1. Main switch
- 2. Clutch switch
- 3. Battery
- 4. Relay assembly
- 5. Turn signal relay
- 6. ECU (engine control unit)
- 7. Rectifier/regulator
- 8. Fuse
- 9. Starter relay
- 10. Rear brake light switch
- 11. Speed sensor
- 12. Throttle body assembly
- 13. Neutral switch assembly
- 14. Engine temperature sensor
- 15. Ignition coil
- 16. Horn
- 17. O<sub>2</sub> sensor
- 18. Lean angle sensor







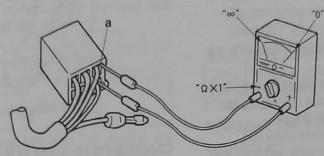
theck each switch for continuity with the multimeter. If the continuity reading is incorrect, check the the connections and if necessary, replace the switch.

Nover insert the tester probes into the coupler terminal slots "a". Always insert the probes from Never this opposite end of the coupler, taking care not to loosen or damage the leads.

Multimeter INS-003 (90890-03243)

Before checking for continuity, set the multimeter continuity mode.

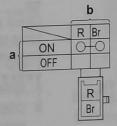
, Belong the checking for continuity, switch back and forth between the switch positions a few times.



The switches and their terminal connections are illustrated as in the following example of the main

The switch positions "a" are shown in the far left column and the switch lead colors "b" are shown in the

The continuity (i. e., a closed circuit) between switch terminals at a given switch position is indicated by -O ". There is continuity between red, and brown when the switch is set to "ON".





### CHECKING THE BULBS AND BULB SOCK-**ETS**

TIP

Do not check any of the lights that use LEDs.

Check each bulb and bulb socket for damage or wear, proper connections, and also for continuity between the terminals.

 ${\sf Damage/wear} \to {\sf Repair} \ {\sf or} \ {\sf replace} \ {\sf the} \ {\sf bulb},$ bulb socket or both.

Improperly connected  $\rightarrow$  Properly connect. No continuity  $\rightarrow$  Repair or replace the bulb, bulb socket or both.

### Types of bulbs

The bulbs used on this vehicle are shown in the illustration on the left.

- Bulbs "a" are used for turn signal lights and can be removed from the socket by pushing and turning the bulb counterclockwise.
- · Bulbs "b" are used for license plate and auxiliary lights and can be removed from their respective sockets by carefully pulling them out.





### Checking the condition of the bulbs

The following procedure applies to all of the bulbs.

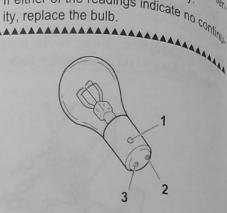
- 1. Remove:
  - · Bulb
- 2. Check:
  - · Bulb (for continuity) (with the multimeter) No continuity → Replace.



Multimeter INS-003 (90890-03243)

Before checking for continuity, set the multimeter to continuity mode.

- a. Connect the positive tester probe to ten Connect the positive tester probe to term al "1" and the negative tester probe to term and "2", and check the continuity.
- b. Connect the positive tester probe to lemma. Connect the positive tester probe to terminal "1" and the negative tester probe to terminal "3", and check the continuity.
- minal 3, and c. If either of the readings indicate no continu



Checking the condition of the bulb sockets The following procedure applies to all of the bulb

- 1. Check:
  - · Bulb socket (for continuity) (with the multimeter) No continuity → Replace.



Multimeter INS-003 (90890-03243)

TIP

Check each bulb socket for continuity in the same manner as described in the bulb section; however, note the following.

- a. Install a good bulb into the bulb socket.
- b. Connect the multimeter probes to the respective leads of the bulb socket.
- c. Check the bulb socket for continuity. If any of the readings indicate no continuity, replace the bulb socket. \*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*



# CHECKING THE FUSE

o avoid a short circuit, always turn the main 10 avoid a ...... of early, always turn the main whitch to "OFF" when checking or replacing

Ifuse.

Remove:

Seat and right side cover

Refer to "GENERAL CHASSIS" on page 4-1

2. Check:

. Fuse Connect the multimeter to the fuse and check the continuity.

The set the multimeter selector to " $\Omega \times 1$ ".



Multimeter INS-003 (90890-03243)

b. If the multimeter indicates "w", replace the AAAAAAAAAAAAAAAAAAAAAA

- 3. Replace:
  - · Blown fuse
- a. Set the main switch to "OFF"
- b. Install a new fuse of the correct amperage
- c. Set on the switches to verify if the electrical circuit is operational.
- d. If the fuse immediately blows again, check the electrical circuit.

| Amperage rating | Q'ty   |
|-----------------|--------|
| 15 A            | 1      |
|                 | rating |

### WARNING

Never use a fuse with an amperage rating other than that specified. Improvising or using a fuse with the wrong amperage rating may cause extensive damage to the electrical system, cause the lighting and ignition systems to malfunction and could possibly cause a fire.

#### 4. Install:

· Seat and right cover Refer to "GENERAL CHASSIS" on page 4-1.

## REPLACING THE ECU (ENGINE CONTROL

- 1. Turn the main switch to "OFF".
- 2. Replace the ECU (engine control unit). Refer to "REMOVING THE ECU (engine control unit)" on page 7-61. Refer to "INSTALLING THE ECU (engine control unit)" on page 7-61.
- 3. Clean the FID (fast idle Device). Refer to "CHECKING THE FID (FAST IDLE DEVICE)" on page 7-71.
- 4. Check:
  - Engine idling speed Start the engine, warm it up, and then measure the engine idling speed

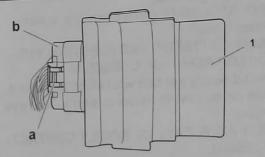


Engine idling speed 1300-1500 r/min

## REMOVING THE ECU (engine control unit)

- 1. Disconnect:
  - ECU coupler "1"

While pushing the portion "a" of the ECU coupler, move the lock lever "b" in the direction of the arrow shown to disconnect the coupler.

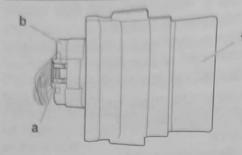


### **INSTALLING THE ECU (engine control unit)**

- 1. Connect:
  - ECU coupler "1"

# ELECTRICAL COMPONENTS ELEC

Connect the ECU coupler, and then push the lock lever "a" of the coupler in the direction of the arrow shown



### CHECKING AND CHARGING THE BATTERY

### **WARNING**

Batteries generate explosive hydrogen gas and contain electrolyte which is made of poisonous and highly caustic sulfuric acid. Therefore, always follow these preventive measures:

- · Wear protective eye gear when handling or working near batteries.
- Charge batteries in a well-ventilated area.
- Keep batteries away from fire, sparks or open flames (e.g., welding equipment, lighted cigarettes).
- DO NOT SMOKE when charging or handling batteries.
- KEEP BATTERIES AND ELECTROLYTE OUT OF REACH OF CHILDREN.
- · Avoid bodily contact with electrolyte as it can cause severe burns or permanent eye injury.

FIRST AID IN CASE OF BODILY CONTACT: **EXTERNAL** 

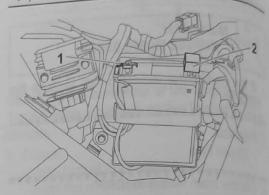
- Skin Wash with water.
- Eyes Flush with water for 15 minutes and get immediate medical attention.

### INTERNAL

- Drink large quantities of water or milk fol. Drink large quit of magnesia, beaten egg or lowed with milk of magnesia, beaten egg or lowed with the lowest lowed with the lowed with the lowest tion.
- 1. Remove:
  - · Seat and right side cover Seat and fight Refer to "GENERAL CHASSIS" on page
- 2. Disconnect:
  - Battery leads (from the battery terminals)

### NOTICE

First, disconnect the negative battery lead "1", and then positive battery lead "2"



- 3. Remove:
  - Battery
- 4. Check:
  - Battery voltage
  - · Electrolyte level in the battery cell
  - Battery charging

a. Connect a multimeter to the battery termi-

- Positive tester probe → positive battery terminal
- Negative tester probe → negative battery terminal

#### TIP\_

The charge state of battery can be checked by measuring its open-circuit voltage (i.e., the voltage when the positive battery terminal is disconnected).

No charging is necessary when the open-circuit voltage equals or exceeds 12.8 V.

b. Check the charge of the battery, as shown in the charts and the following example.

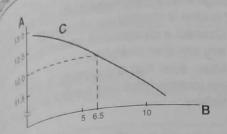
ELEC =

vancircuit voltage = 12.0 V

vancircuit voltage = 6.5 hours

vancircuit time = 6.5 hours

vancircuit time = 20-30%



Open-circuit voltage (V)

Open-circuit voltage (V)

Charging time (hours)

Charging time the open-circuit voltage (V)

Relationship between the open-circuit voltage and the charging time at 20 °C (68 °F)

Relationship between the open-circuit voltage (Relationship)

Relationship time the charging time at 20 °C (68 °F)

Relationship time (hours)

Relationship time the charging time at 20 °C (68 °F)

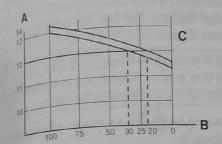
Relationship time (hours)

Relationship time (hours)

Relationship between the open-circuit voltage (N)

Relationship the charging time at 20 °C (68 °F)

Relationship values vary with the temperature, the condition of the battery plates, and the electrolyte level.



B. Charging condition of the battery (%)
C. Ambient temperature 20 °C (68 °F)

### 5. Charge:

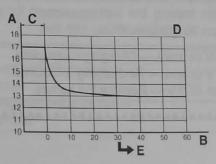
Battery
 (refer to the appropriate charging method
 illustration)

### **WARNING**

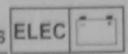
Do not quick charge a battery

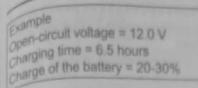
### NOTICE

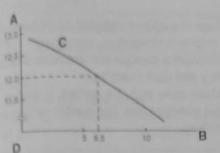
- Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.
- If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.
- When charging a battery, be sure to remove it from the vehicle. (If charging has to be done with the battery mounted on the vehicle, disconnect the negative battery lead from the battery terminal.)
- To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.
- Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.
- Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.
- If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot batteries can explode!



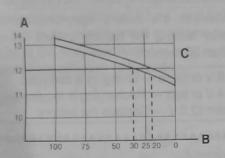
- A. Open-circuit voltage (V)
- B. Time (minutes)
- C. Charging
- D. Ambient temperature 20 °C (68 °F)
- E. Check the open-circuit voltage.







- A. Open-circuit voltage (V)
- B. Charging time (hours)
- C. Relationship between the open-circuit voltage and the charging time at 20 °C (68 °F)
- D. These values vary with the temperature, the condition of the battery plates, and the electrolyte level.



- A. Open-circuit voltage (V)
- B. Charging condition of the battery (%)
- C. Ambient temperature 20 °C (68 °F)

### \*\*\*\*

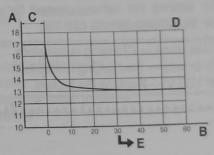
- 5. Charge:
  - Battery
     (refer to the appropriate charging method illustration)

### A WARNING

Do not quick charge a battery

#### NOTIC

- Do not use a high-rate battery charger since it forces a high-amperage current into the battery quickly and can cause battery overheating and battery plate damage.
- If it is impossible to regulate the charging current on the battery charger, be careful not to overcharge the battery.
- When charging a battery, be sure to remove it from the vehicle. (If charging has to be done with the battery mounted on the vehicle, disconnect the negative battery lead from the battery terminal.)
- To reduce the chance of sparks, do not plug in the battery charger until the battery charger leads are connected to the battery.
- Before removing the battery charger lead clips from the battery terminals, be sure to turn off the battery charger.
- Make sure the battery charger lead clips are in full contact with the battery terminal and that they are not shorted. A corroded battery charger lead clip may generate heat in the contact area and a weak clip spring may cause sparks.
- If the battery becomes hot to the touch at any time during the charging process, disconnect the battery charger and let the battery cool before reconnecting it. Hot batteries can explode!



- A. Open-circuit voltage (V)
- B. Time (minutes)
- C. Charging
- D. Ambient temperature 20 °C (68 °F)
- E. Check the open-circuit voltage.



## Charging method using a variable-current (voltage) charger

Measure the open-circuit voltage prior to charging.

TIP

Voltage should be measured 30 minutes after the engine is stopped.

- b. Connect a charger and ammeter to the battery and start charging.
- c. Make sure that the current is higher than the standard charging current written on the battery.

TIP

If the current is lower than the standard charging current written on the battery, set the charging voltage adjust dial at 20-24 V and monitor the amperage for 3-5 minutes to check the battery.

- Standard charging current is reached Battery is good.
- Standard charging current is not reached Replace the battery.
- d. Adjust the voltage so that the current is at the standard charging level.
- e. Set the time according to the charging time suitable for the open-circuit voltage.
- f. If charging requires more than 5 hours, it is advisable to check the charging current after a lapse of 5 hours. If there is any change in the amperage, read just the voltage to obtain the standard charging current.
- g. Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.

12.8 V or more --- Charging is complete. 12.4 V or less --- Recharging is required. Under 12.0 V --- Replace the battery.

\_\_\_\_\_

Charging method using a constant voltage age charger

a. Measure the open-circuit voltage prior to charging.

Voltage should be measured 30 minutes after the engine is stopped.

- b. Connect a charger and ammeter to the battery and start charging.
- c. Make sure that the current is higher than the standard charging current written on the battery.

If the current is lower than the standard charging current written on the battery, this type of battery charger cannot charge the MF battery. A variable voltage charger is recommended.

d. Charge the battery until the battery's charging voltage is 15 V.

Set the charging time at 20 hours (maximum).

e. Measure the battery open-circuit voltage after leaving the battery unused for more than 30 minutes.

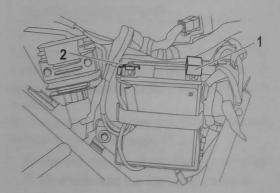
12.8 V or more --- Charging is complete. 12.4 V or less --- Recharging is required. Under 12.0 V --- Replace the battery.

### \*\*\*\*\*

- 6. Install:
  - Battery
- 7. Connect:
  - Battery leads (to the battery terminals)

### NOTICE

First, connect the positive battery lead "1", and then the negative battery lead "2".





8. Check: , Battery terminals

Sulphation → Clean with hot water. Loose connection → Connect properly.

Lubricate:

. Battery terminals

Recommended lubricant Dielectric grease

10. Install:

. Seat and right side cover Refer to "GENERAL CHASSIS" on page 4-1.

CHECKING THE RELAYS

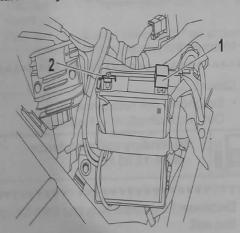
Check each switch for continuity with the Multimeter. If the continuity reading is incorrect, replace the relay.



Multimeter INS-003 (90890-03243)

- 1. Disconnect the relay from the wire harness.
- 2. Connect the multimeter ( $\Omega \times 1$ ) and battery (12 V) to the relay terminal as shown. Check the relay operation. Out of specification → Replace.

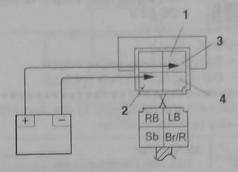
### Starter relay



- 1. Positive battery terminal
- 2. Negative battery terminal
- 3. Positive tester probe
- 4. Negative tester probe



Result Continuity (between "3" and "4") Starting circuit cut-off relay



- 1. Positive battery terminal
- 2. Negative battery terminal
- 3. Positive tester probe
- 4. Negative tester probe



Result Continuity (between "3" and "4")

### CHECKING THE TURN SIGNAL RELAY

- 1. Check:
  - Turn signal relay input voltage Out of specification  $\rightarrow$  The wiring circuit from the main switch to the turn signal relay coupler is faulty and must be repaired.

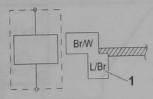


Turn signal relay input voltage DC 12 V

a. Connect the multimeter to the turn signal relay terminal as shown.



- Positive tester probe → brown "1"
- Negative tester probe → ground



- b. Set the main switch to "ON".
- c. Measure the turn signal relay input voltage. \*\*\*\*





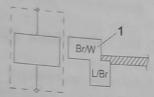
### Turn signal relay output voltage DC 12 V

- 2. Check
  - Turn signal relay output voltage Out of specification → Replace.
- a. Connect the multimeter to the turn signal relay terminal as shown.



### Multimeter INS-003 (90890-03243)

- ullet Positive tester probe ulletbrown/white "1"
- Negative tester probe → ground



- b. Set the main switch to "ON".
- c. Measure the turn signal relay output voltage. \*\*\*\*\*\*\*

## CHECKING THE SPARK PLUG CAP

- 1. Check:
  - · Spark plug cap resistance Out of specification → Replace.

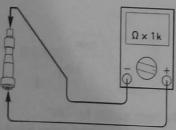


### Spark plug cap resistance 3.75-6.25 kO

- a. Remove the spark plug cap from the spark plug lead.
- b. Connect the multimeter ( $\Omega$  × 1k) to the spark plug cap as shown.



### Multimeter INS-003 (90890-03243)



c. Measure the spark plug cap resistance. \*\*\*\*\*

### CHECKING THE IGNITION COIL

- 1. Check:
  - · Primary coil resistance Out of specification → Replace



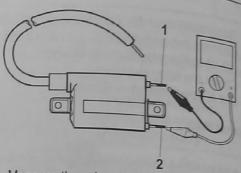
Primary coil resistance 2.16-2.64 Ω

- a. Disconnect the ignition coil connectors from
- the ignition  $\infty$ .
  b. Connect the multimeter ( $\Omega \times 1$ ) to the ignition  $\Omega$



### Multimeter INS-003 (90890-03243)

- Positive tester probe → Terminal "1"
- Negative tester probe → Terminal "2"



c. Measure the primary coil resistance.

## \*\*\*\*\*\*\*\*\*\*\*\*

- 2. Check:
  - · Secondary coil resistance Out of specification → Replace.

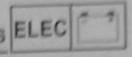


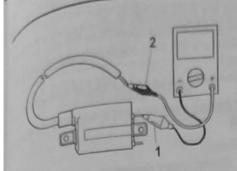
Secondary coil resistance 8.64-12.96 kΩ

- a. Disconnect the spark plug cap from the ignition coil.
- b. Connect the multimeter ( $\Omega \times 1k$ ) to the ignition coil as shown.



- Positive tester probe → Terminal "2"
- Negative tester probe → HT Lead "1"





Measure the secondary coil resistance. AND THE STREET OF THE STREET O

# CHECKING THE IGNITION SPARK GAP

. Ignition spark gap Out of specification -> Perform the ignition system troubleshooting, starting with

Refer to "TROUBLESHOOTING" on page 7-3



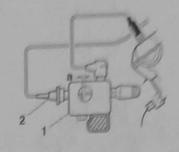
Minimum ignition spark gap 6.0 mm

If the ignition spark gap is within specification, the ignition system circuit is operating normally.

- a. Disconnect the spark plug cap from the spark plug.
- b. Connect the ignition checker "1" as shown.



Ignition checker INS-007 (90890-06754)



- 1. Ignition checker
- 2. Spark plug cap
- c. Turn the main switch to "ON" and engine stop switch to "O".
- d. Measure the ignition spark gap "a"
- e. Crank the engine by pushing the start switch "@".

\*\*\*\*

### CHECKING THE CRANKSHAFT POSITION SENSOR

- 1. Disconnect:
  - Crankshaft position sensor coupler (from the wire harness)
- 2. Check:
- Crankshaft position sensor resistance Out of specification → Replace the crankshaft position sensor/stator assembly.



Crankshaft position sensor resistance 192-288 Ω

a. Connect the multimeter to the crankshaft position sensor coupler as shown.



- Positive tester probe → green "1"
- Negative tester probe → blue/yellow "2"

ELEC



b. Measure the crankshaft position sensor resistance

### CHECKING THE LEAN ANGLE SENSOR

- 1. Remove:
  - Lean angle sensor
- 2. Check:
  - · Lean angle sensor output voltage Out of specification → Replace.



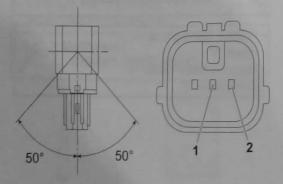
Lean angle sensor output voltage Less than 50°: 0.4-1.4 V More than 50°: 3.7-4.4 V

- a. Connect the lean angle sensor to the wire harness.
- b. Connect the multimeter (DC 20 V) to the lean angle sensor coupler as shown.



Multimeter INS-003 (90890-03243)

- Positive tester probe → Terminal"1"
- Negative tester probe → Terminal "2"



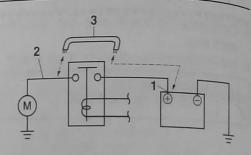
- c. Set the main switch to "ON"
- d. Tilt the lean angle sensor to 50°
- d. Tilt the lean angle sensor output voll.

# CHECKING THE STARTER MOTOR OPERA

- 1. Check:
  - Starter motor operation Starter motor operate → Perform the electric Does not operation by the property of the prop with step 4. Refer to "TROUBLESHOOTING" on page
- a. Connect the positive battery terminal and starter motor lead "2" with a jumper lead "3"

### WARNING

- A wire that is used as a jumper lead must have at least the same capacity of the bat. tery lead, otherwise the jumper lead may burn.
- This check is likely to produce sparks, therefore, make sure no flammable gas or fluid is in the vicinity.



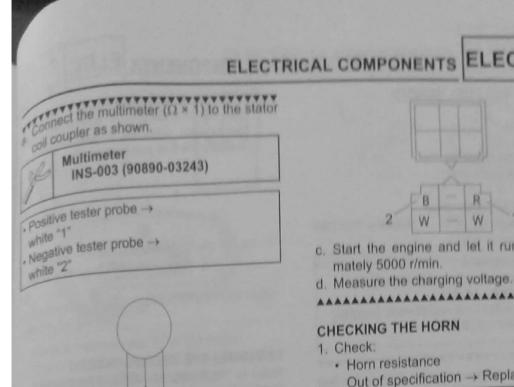
b. Check the starter motor operation. \*\*\*\*\*\*

### CHECKING THE STATOR COIL

- 1. Disconnect:
  - · Stator coil coupler (from the wire harness)
- 2. Check:
  - · Stator coil resistance Out of specification → Replace the crankshaft position sensor/stator assembly.



Stator coil resistance  $0.456 - 0.684 \Omega$ 



b. Measure the stator coil resistance. \*\*\*\*\*\*

### CHECKING THE RECTIFIER/REGULATOR

- 1. Check:
  - Charging voltage Out of specification → Replace the rectifier/regulator.



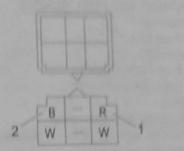
Charging voltage 14.0-14.8 V at 5000 r/min

- a. Set the engine tachometer to the spark plug
- b. Connect the multimeter to the rectifier/regulator coupler as shown.



Multimeter INS-003 (90890-03243)

- Positive tester probe →
- Negative tester probe → black "2"



- c. Start the engine and let it run at approximately 5000 r/min.
- Measure the charging voltage. \*\*\*\*\*

### CHECKING THE HORN

- 1. Check:
  - · Horn resistance Out of specification → Replace.



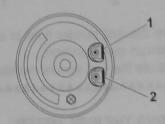
Coil resistance 1.35-1.75 Ω

- \*\*\*\* a. Disconnect the horn connectors from the horn terminals.
- b. Connect the multimeter ( $\Omega \times 1$ ) to the horn terminals.



Multimeter INS-003 (90890-03243)

- Positive tester probe → horn terminal "1"
- Negative tester probe → horn terminal "2"



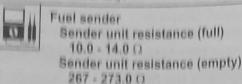
\*\*\*\*\*

c. Measure the horn resistance.



### CHECKING THE FUEL SENDER

- Remove
  - \* First tank
- 2. Remove.
  - Fuel pump assy: (from the fuel tank)
- a Check
  - Fuel sender resistance
     Out of specification → Replace the fuel sender assembly.

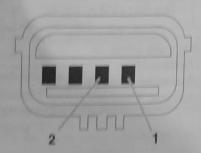


a. Connect the multimeter ( $\Omega \times 100$ ) to the fuel sender coupler as shown.



Multimeter INS-003 (90890-03243)

- Positive tester probe → Terminal "1"
- Negative tester probe → Terminal "2"



 b. Move the fuel sender float to minimum and maximum level position.

\*\*\*\*\*\*

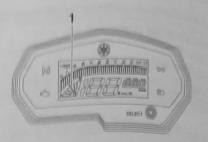
c. Measure the fuel sender resistance.

#### CHECKING THE FUEL METER

This model is equipped with a self-diagnosis device for the fuel level dectection circuit.

- 1. Check:
  - Fuel meter "1"
     (Turn the main switch to "ON".)
     Warning light comes on for a few seconds, then goes off → Warning light is OK.
     Warning light does not come on → Replace the meter assembly.

Warning light flashes eight times, then goes off for 3 seconds in a repeated cycle (malfunction detected in fuel sender) Replace the fuel pump assembly.



CHECKING THE SPEED SENSOR
Refer to "Fault code No. 42" in "TROUBLESHOOTING DETAILS" on page 7-70.

## CHECKING THE ENGINE TEMPERATURE SENSOR

- 1. Remove:
  - Engine temperature sensor

### **WARNING**

- Handle the engine temperature sensor with special care.
- Never subject the engine temperature sensor to strong shocks. If the engine temperature sensor is dropped, replace it.
- 2. Check:
  - Engine temperature sensor resistance
     Out of specification → Replace.

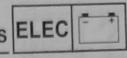


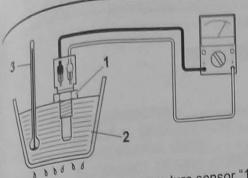
Engine temperature sensor resistance

28500-31500 Ω at 0°C 1818-2223 Ω at 75 °C

a. Connect the multimeter ( $\Omega \times 100$ ) to the engine temperature sensor terminals as shown.







Immerse the engine temperature sensor "1" in a container filled with water "2".

Make sure the engine temperature sensor terminals do not get wet.

c. Place a thermometer "3" in the water.

- d. Slowly heat the water, and then let it cool
- down to the specified temperature. e. Check the engine temperature sensor resis-
- tance.

### \*\*\*

- 3. Install:
  - · Engine temperature sensor



Engine temperature sensor 9 N·m (0.9 kgf·m, 6.6 lb·ft)

## CHECKING THE FID (FAST IDLE DEVICE)

- 1. Disconnect:
  - · FID coupler
- 2. Check:
  - FID resistance
- a. Disconnect the FID (fast idle device) coupler from the wire harness.
- b. Connect the Multimeter ( $\Omega \times 10$ ) to the terminals of the FID.
- ullet Positive tester probe o

Terminal "1"

ullet Negative tester probe o

Terminal "2"

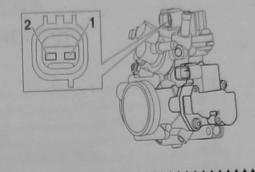


Multimeter INS-003 (90890-03243)

c. Measure the FID resistance. Out of specification  $\rightarrow$  Replace the throttle body assembly.



**FID** resistance 31.5-38.5 Ω



TRBL ?

# CHAPTER 8 TROUBLESHOOTING

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### **TROUBLESHOOTING**

### GENERAL INFORMATION

The following guide for troubleshooting does not cover all the possible causes of trouble. It should be helpful, however, as a guide to basic trouble-shooting. Refer to the relative procedure in this manual for checks, adjustments, and replacement of parts.

### STARTING FAILURES

### Engine

- 1. Cylinder and cylinder head
- · Loose spark plug
- · Loose cylinder head or cylinder
- Damaged cylinder head gasket
- Damaged cylinder gasket
- · Worn or damaged cylinder
- · Incorrect valve clearance
- · Improperly sealed valve
- Incorrect valve-to-valve-seat contact
- · Incorrect valve timing
- · Faulty valve spring
- · Seized valve
- 2. Piston and piston ring(s)
- · Improperly installed piston ring
- · Damaged, worn or fatigued piston ring
- Seized piston ring
- · Seized or damaged piston
- 3. Air filter
  - · Improperly installed air filter
  - · Clogged air filter element
- Crankcase and crankshaft
- Improperly assembled crankcase
- · Seized crankshaft

### Fuel system

- 1. Fuel tank
- · Empty fuel tank
- · Clogged fuel tank breather hose
- · Clogged or damage fuel hose
- Clogged fuel filter
- · Deteriorated or contaminated fuel
- 2. Fuel pump
- · Faulty fuel pump
- 3. Throttle body
- · Deteriorated or contaminated fuel
- · Sucked-in air

- 1. Battery
- Discharged battery
- Faulty battery
- 2. Fuse(s)
- · Blown, damaged or incorrect fuse
- · Improperly installed fuse
- 3. Spark plug
- · Incorrect spark plug gap
- Incorrect spark plug heat range
- Fouled spark plug
- Worn or damaged electrode
- Worn or damaged insulator
- · Faulty spark plug cap
- 4. Ignition coil
  - Cracked or broken ignition coil body
- Broken or shorted primary or secondary color
- Faulty spark plug lead
- 5. Ignition system
- Faulty ECU
- · Faulty crankshaft position sensor
- Broken AC Magneto rotor woodruff key
- 6. Switches and wiring
- · Faulty main switch
- · Faulty engine stop switch
- · Broken or shorted wiring
- Faulty neutral switch
- · Faulty start switch
- · Faulty clutch switch
- Improperly grounded circuit
- Loose connections
- 7. Starting system
- · Faulty starter motor
- · Faulty starter relay
- · Faulty starting circuit cut-off relay
- · Faulty starter clutch

#### INCORRECT ENGINE IDLING SPEED

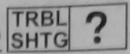
#### Engine

- 1. Cylinder and cylinder head
- · Incorrect valve clearance
- · Damaged valve train components
- 2. Air filter
  - Clogged air filter element

#### Fuel system

- 1. Throttle body
- · Damaged or loose throttle body joint
- · Faulty FID system
- · Improper throttle cable free play
- Flooded throttle body

### TROUBLESHOOTING



## Electrical system

- 1. Battery
- · Discharged battery
- Faulty battery.
- 2. Spark plug
- . Incorrect spark plug gap
- · Incorrect spark plug heat range
- · Fouled spark plug
- · Worn or damaged electrode
- · Worn or damaged insulator
- · Faulty spark plug cap
- 3. Ignition coil
- · Broken or shorted primary or secondary coils
- · Faulty spark plug lead
- Cracked or broken ignition coil
- 4. Ignition system
- · Faulty ECU
- · Faulty crankshaft position sensor
- Broken AC Magneto rotor woodruff key

### POOR MEDIUM-AND-HIGH-SPEED PERFORMANCE

Refer to "STARTING FAILURES" on page 8-1.

#### Engine

- 1. Air filter
- Clogged air filter element

#### Fuel system

- 1. Fuel pump
- Faulty fuel pump
- 2. Throttle body
- · Faulty throttle body

### **FAULTY GEAR SHIFTING**

### Shifting is difficult

Refer to "Clutch drags".

### SHIFT PEDAL DOES NOT MOVE

### Shift shaft

· Bent shift shaft

#### Shift drum and shift forks

- · Foreign object in a shift drum groove
- · Seized shift fork
- · Bent shift fork guide bar

#### Transmission

- · Seized transmission gear
- Foreign object between transmission gears
- · Improperly assembled transmission

#### JUMPS OUT OF GEAR

#### Shift shaft

- · Incorrect shift pedal position
- · Improperly returned stopper lever

#### Shift forks

· Worn shift fork

#### Shift drum

- · Incorrect axial play
- · Worn shift drum groove

#### Transmission

Worn gear dog

### **FAULTY CLUTCH**

### Clutch slips

- 1. Clutch
- Improperly assembled clutch
- Improperly adjusted clutch cable
- Loose or fatigued clutch spring
- · Worn friction plate
- Worn clutch plate
- 2. Engine oil
- Incorrect oil level
- Incorrect oil viscosity (low)
- · Deteriorated oil

#### Clutch drags

- 1. Clutch
- Unevenly tensioned clutch springs
- Warped pressure plate
- · Bent clutch plate
- Swollen friction plate
- · Bent clutch push rod
- · Broken clutch boss
- · Burnt primary driven gear bushing
- · Improper alignment of clutch push lever mark with crankcase mark
- 2. Engine oil
  - Incorrect oil level
- Incorrect oil viscosity (high)
- · Deteriorated oil

#### **OVERHEATING**

#### Ignition system

- Improper spark plug gap
- Improper spark plug heat range

### Compression system

- · More carbon deposition
- · Improperly adjusted valve timing
- · Improperly adjusted valve clearance

#### Engine oil

- · Incorrect engine oil level
- · Improper engine oil quality
- · Low engine oil quality

### Cooling system

- 1. Low Engine oil level
- 2. Oil cooler
- · Damage or leaking oil cooler
- 3. Oil pump
- Damaged or faulty oil pump
- 4. Hose(s) and pipe(s)
  - · Damaged hose
- · Improperly connected hose
- · Damaged pipe
- Improperly connected pipe

### Fuel system

- 1. Throttle body
- · Damaged or loose throttle body joint
- 2. Air filter
  - · Clogged air filter element

#### Chassis

- 1. Brake(s)
- Dragging brake

### Electrical system

- 1. Spark plug
- · Incorrect spark plug gap
- · Incorrect spark plug heat range
- Ignition system
- Faulty ECU

#### POOR BRAKING PERFORMANCE

- 1. Disc brake
- · Worn brake pad
- · Worn brake disc
- · Air in hydraulic brake system
- · Leaking brake fluid
- · Faulty brake caliper kit
- · Faulty brake caliper seal
- · Loose union bolt
- · Damaged brake hose
- · Oil or grease on the brake disc
- · Oil or grease on the brake pad
- · Incorrect brake fluid level

### FAULTY FRONT FORK LEGS

### Leaking oil

- Bent, damaged or rusty inner tube
- · Cracked or damaged outer tube
- · Improperly installed oil seal
- · Damaged oil seal lip
- · Incorrect oil level (high)
- · Loose damper rod bolt
- Damaged damper rod bolt copper washer
- Cracked or damaged cap bolt O-ring

### Malfunction

- Bent or damaged inner tube
- Bent or damaged outer tube
- Damaged fork spring
- · Bent or damaged damper rod
- Incorrect oil viscosity
- Incorrect oil level

### UNSTABLE HANDLING

- 1. Handlebar
- Bent or improperly installed handlebar
- 2. Steering head components
- Improperly installed upper bracket
- Improperly installed lower bracket (improperly tightened ring nut)
- · Bent steering stem
- · Damaged ball bearing or bearing race
- 3. Front fork leg(s)
- · Unevenly oil levels (both front fork legs)
- · Unevenly tensioned fork spring (both front fork legs)
- · Broken fork spring
- · Bent or damaged inner tube
- · Bent or damaged outer tube
- 4. Swingarm
- · Worn bearing
- · Bent or damaged swingarm

### TROUBLESHOOTING



- 5. Rear shock absorber assembly Faulty rear shock absorber spring
- · Leaking oil
- 6. Tire(s)
- Unevenly tire pressures (front and rear)
- . Incorrect tire pressure
- · Unevenly tire wear
- 7. Wheel(s)
- · incorrect wheel balance
- . Deformed cast wheel
- . Damaged wheel bearing
- . Bent or loose wheel axle
- . Excessive wheel runout
- 8. Frame
- · Bent frame
- Damaged steering head pipe
- · Improperly installed bearing race

### FAULTY LIGHTING OR SIGNALING SYSTEM

## Headlight does not come on

- · Wrong headlight assembly
- · Too many electrical accessories
- · Hard charging
- Incorrect connection
- Improperly grounded circuit
- · Poor contacts

### Brake/tail light does not come on

- Wrong brake/tail light assembly
- · Too many electrical accessories
- Incorrect connection
- · Faulty battery
- · Incorrectly adjusted rear brake light switch

### Turn signal does not come on

- · Faulty turn signal switch
- Faulty turn signal relay

- · Burnt-out turn signal bulb
- · Incorrect connection
- · Damaged or faulty wire harness
- · Improperly grounded circuit
- Faulty battery
- · Blown, damaged or incorrect fuse

#### Turn signal blinks slowly

- Faulty turn signal relay
- · Faulty main switch
- · Faulty turn signal switch
- · Incorrect turn signal bulb

### Turn signal remains lit

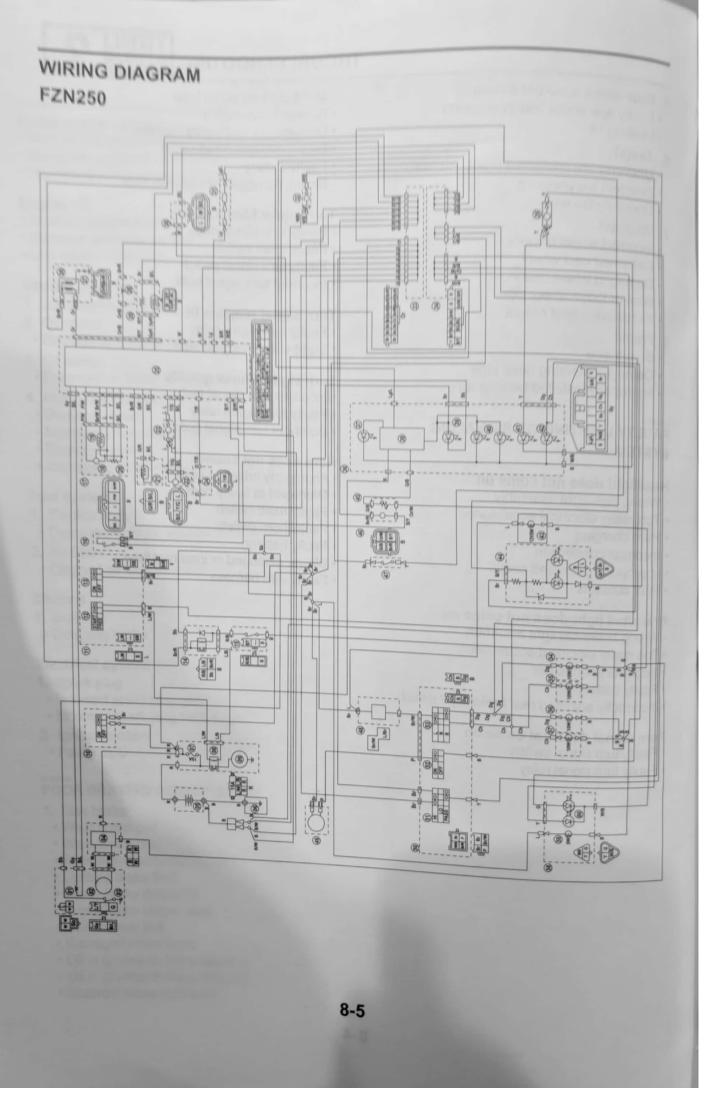
- Faulty turn signal relay
- · Burnt-out turn signal bulb

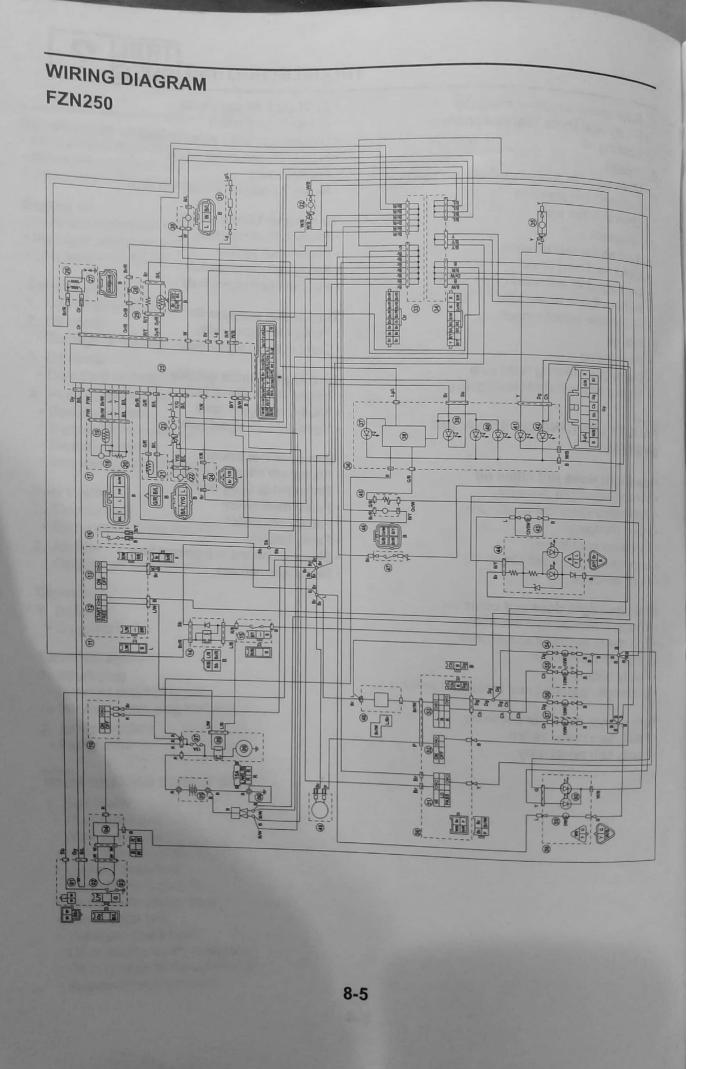
#### Turn signal blinks quickly

- Incorrect turn signal bulb
- Faulty turn signal relay
- · Burnt-out turn signal bulb

#### Horn does not sound

- · Improperly adjusted horn
- · Damaged or faulty horn
- · Faulty main switch
- · Faulty horn switch
- · Faulty battery
- · Blown, damaged or incorrect fuse
- · Faulty wire harness





# WIRING DIAGRAM

| FZN250                            |
|-----------------------------------|
| 1. Crankshaft position sensor     |
| 2 Stator coil                     |
| 2 Neutral switch                  |
| Rectifier/Regulator               |
| 5. Battery                        |
| 6 Engine ground                   |
| 7. Fuse                           |
| 8. Starter relay                  |
| 9. Starter motor                  |
| 10.Main switch                    |
| 11.Right handlebar switch         |
| 12.Start switch                   |
| 13.Engine stop switch             |
| 14. Starting circuit cut of relay |
| 15.Clutch switch                  |
| 16.Front brake light switch       |
| 17.Throttle body sensor           |
| assembly                          |
| 18.Intake air pressure sensor     |
| 19.Intake air temperature sen-    |
| sor                               |
| 20.Throttle position sensor       |
| 21.Engine temperature sensor      |
| 22.Lean angle sensor              |
| 23.Joint 1                        |
| 24.FID (Fast Idle Device)         |
| 25.ECU (Engine Control Unit)      |
| 26.Ignition coil                  |
| 27.Spark plug                     |
| 28.Fuel injection                 |
| 29.O <sub>2</sub> sensor          |
| 30.Speed sensor                   |
| 31.Yamaha diagnostic tool         |
| coupler                           |
| 32. Joint 2                       |
| 33.J/C 2 (Joint connector)        |
| 34.J/C 3 (Joint connector)        |
| 35.Joint 3                        |

36.Meter assembly

40.Meter light

38.Multi-function display 39.Neutral Indicator light

37.Engine trouble warning light

| 41.High beam indicator light 42.Turn signal indicator light 43.License plate light 44.Brake/tail light 45.Fuel sender 46.Fuel pump 47.Rear brake light switch 48.Turn signal relay 49.Horn 50.Left handlebar switch 51.Dimmer and pass switch 52.Horn switch 53.Turn signal switch 54.Rear turn signal light (right) 55.Rear turn signal light (right) 56.Front turn signal light (right) 57.Front turn signal light (left) 58.Headlight assembly 59.Auxiliary light 60.Headlight |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

| 3r          | Brown           |
|-------------|-----------------|
| Ch          | Chocolate       |
| )g          | Dark green      |
| 3           | Green           |
|             | Blue            |
| a           | Light green     |
| 9           | Orange          |
| -g<br>O     | Pink            |
| 3           | Red             |
| Sb          | Sky blue        |
| N           | White           |
| 7           | Yellow          |
| 3/L         | Black/Blue      |
| 3/W         | Black/White     |
| Br/W        | Brown/White     |
| Br/R        | Brown/Red       |
|             | Green/Black     |
| 3/B<br>3/R  | Green/Red       |
| G/L         | Green/Blue      |
| 3/L<br>3/Y  | Green/Yellow    |
| Sy/R        | Gray/Red        |
| JB          | Blue/Black      |
| /W          | Blue/White      |
| Dr/B        | Orange/Black    |
| )//D        | Orange/White    |
| Dr/W<br>P/W | Pink/ White     |
| R/B         | Red/Black       |
| //G         | Yellow/Green    |
| N/B         | White/Black     |
| B/Y         | Black/Yellow    |
| //R         | Yellow/Red      |
| R/Y         | Red/Yellow      |
| 3/R         | Black/Red       |
| _g/L        | Light green/Blu |
| -5          |                 |
|             |                 |

Black

